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General Scientific

ON THE DIFFERENTIATION OF AURICULAR FIBRILLATION AND ITS TREATMENT.*

THOMAS E. SATTERTHWAITE, M.D.,
New York.

While much has been written about auricular affections of late years, there are many matters relating to them which are still obscure.

For example, physiologists do not know as yet to what extent the impulse causing a heart beat is myogenic or neurogenic.

However, ordinarily the impulse takes its origin in the S-A, i. e., sino-auricular, or so-called upper node in the right auricle. But the influence extends itself secondarily to the A-V, i. e., auriculo-ventricular or inferior node of the same auricle. Passing onward, it reaches, first the left auricle and then the right ventricle through the muscle bundle of His. Eventually it is spread over the net-work of Purkinje which covers the lining wall of both ventricles.

But this influence may also originate in the coronary sinus which opens into the right auricle. There are also numerous other points from which the impulse may emanate that contracts auricles and ventricles.

In fact, if the upper node gets to be out of commission, another of its fellows will supplant it in function, one acting vicariously for the other. We also know that if the normal rate, which in the adult is apt to be set at 72 to 76, is interrupted by a loss of conductive energy in the bundle of His, some point in the ventricle may of itself start the impulse which then will develop a rate round about 30, or somewhere about half the normal.

Usually, when the impulse has started from the right auricle, contraction takes place, first in the conus or infundibulum, or in the anterior papillary muscle lying beneath the conus. The remainder of the right ventricle is then activated, except that part of the conus immediately beneath the pulmonary valve. For this part is the last to feel the impulse. On the other hand, in the left ventricle, the first portion to be excited is the apex, then neighboring parts, and finally the base.

Now a ventricle will only contract in response to a certain number of impulses during a given period. It

requires a rest after each contraction, and it takes it. This interval of rest is called the "refractory stage" and the length of this period with relation to other refractory periods, helps us, by the assistance of the electrocardiograph (or polygraph in some instances) to differentiate certain forms of cardiac arrhythmias.

Of these, I have made the following classification:

1. Sinus or vagus arrhythmias.
2. Extra-systolic arrhythmias.
3. Heart block.
4. Adams-Stokes disease.
5. Auricular fibrillation with its subvarieties, Flutter and Flicker.
6. Ventricular fibrillation.
7. Pulsus Alternans.

Now, all of these arrhythmias represent distinct complexes which can be differentiated either by ordinary clinical methods or by the electrocardiograph or polygraphic instruments. As a matter of fact, nearly every one of these divisions as here given can be determined at times without the two instrumental agencies mentioned. This is a very important matter, because one usually needs in such cases only the finger and a watch, for the mechanical part of the diagnosis.

But arrhythmias act usually in combination. For example, in Heart block and in Adams-Stokes disease, Pulsus alternans and Ventricular fibrillation, there may be Extra systoles. Again, Auricular flutter may pass to Auricular fibrillation and back again to Flutter. These changing conditions are clearly shown either by electrocardiograms or polygrams. Sometimes both are necessary to elucidate exceptional activities.

Auricular fibrillation and flutter merely represent differing degrees of auricular contractions, or spasms. When the rate does not exceed 200-300 per minute, they are classed under the term fibrillation; when they surpass it to a certain point, they are known as flutter. The rapidity in the latter is very great. Except under effectual medication, the auricle beats under these conditions much more rapidly than the ventricle, usually maintaining a rate at about 2-1. There is in such cases not a defect in conductivity (or in other words, incomplete heart block) but a shower of stimuli coming simultaneously or successively from different auricular centers. In auricular fibrillation, the auricle is then actually in a parietic condition. While it is fairly full during

*Read before the American Therapeutic Society at Richmond, Va., June 8, 1918.

diastole, a series of minute convulsive movements, which are in reality imperfect local contractions, are constantly taking pace in one part or another in the walls of the sac. They are shown as wavelets in polygrams. (See Fig. 5).

There is an allied condition which has recently been called "flicker." Here the vibrations may reach as much as 3,000 or more per minute. They can be induced experimentally by stimulating the vagi. (Rothberger and Winterberg, *Wien. Klin. Woch.*, May 14, 1914). Auricular fibrillation can also be caused by mere pressure on the vagi. When, in such instances, the impulse fails to activate the ventricle, the condition is known as "Ventricular escape."

One of the most characteristic conditions entering into auricular fibrillation, is the auricular paresis that has been referred to. At first it was thought to be paralysis.

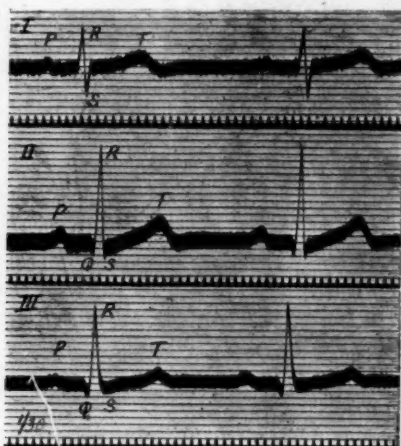


Fig. 1. Normal electrocardiograms from the three leads according to Lewis.

*In order to facilitate an understanding of this paper, schematic examples of normal electrocardiograms and polygrams have been introduced. (See Figs. 1, 2 and 3)

P represents the auricular wave. R, the initial ventricular wave. T, the final ventricular wave. Q is the negative wave following contractions of the His muscle. S the negative wave following the initial ventricular contraction R.

The normal auricular wave P, of the electrocardiogram (Fig. 1) is now supplanted by a series of waves up to 200 or 300 to the minute, as I have already stated. When they rise above it in the hundreds, the condition is known as flutter; when they reach into the thousands, the condition is known as flicker.

It should be understood that the auricles are reservoirs rather than pumps. They are never emptied, even in health, for their so-called valves are really ostia that never close. The muscular coats of the auricle are also very thin, especially the left. Auricles are, in fact, sacs that are easily distended but have little propulsive power. It is this flabbiness of their tissues that contributes, more than failing ventricles, to heart failure.

The cause of fibrillation has seldom been traced to a pathological lesion.

Oppenheimer (*Proc. of the N. Y. Path. Soc.*, November and December, 1912) has recorded one instance, however, where a calcific plate was found in the left auricle.

A. E. Cohn and J. D. Heard (*N. Y. Med. Jr.*, July 26, 1913) found in a similar instance a lesion of the sino-auricular node, but without being sure of any causal

relation between the disease of the node and the arrhythmia.

Neuhof, however (*Med. Rec.*, Dec. 1, 1915) has reported a case where auricular fibrillation was associated with an acute pericarditis. Fibrotic deposits sometimes occur in the auricle. It is usually, however, credited to myocardial disease, and the characteristic waves in the electrocardiogram regarded as significant of myocardial disease are quite apt to be present. It is not unlikely that the cause at times may be a heart strain. According to White (*Boston Med. & Surg. Jr.*, Dec. 2, 1915) it is also apt to be associated with the lithaemic condition, arteriosclerosis, hyperthyroidism and the syphilitic heart. And so, we may at least say we are gradually approaching a knowledge of the causes of fibrillation, though the data are as yet fragmentary, at any rate so far as they bear on pathological lesions. Yet fibrillation may be functional. G. Canby Robinson (*Archives of Internal Medicine*, Feb., 1914) has reported a case where a transient form was caused by pressure on the vagus. It can also be produced by electrical stimulation of the vagi. (Rothberger and Winterberg, *Arch. f. d. Ges. Phys.*, 1910, cxxxi, 387 et seq.) and by chloroform, tobacco and tea (McWilliams, *Boston Med. & Surg. Jr.*, Oct. 10, 1914). I have come across it in the jugular pulse tracings of a boy who had the juvenile type of arrhythmia (sinus arrhythmia). It may also be due, I think, to neurotic conditions. But these physiological examples of auricular fibrillation, being of the transient type, are not causes for alarm.

In fibrillation not relieved by medication, there is apt to be great shortness of breath on exertion, though not necessarily while resting; intense or violent precordial pain, greater, as a rule, than in any other form of heart disease. Sleeplessness at night is another marked feature. The heart beats are apt to be excessive but only a certain number reach the wrist, so that with an apex beat of 120, the radial pulse may be about one-half, a 2-1 relation, approximately. This condition of the pulse has given to the condition the name "Pulse deficit." (Hart, *N. Y. Med. Rec.*, Jan. 11, 1913). Murmurs may or may not be present, but coupled beats are sometimes noticeable. There is also no uniformity in the interventricular intervals. This latter is one of the most characteristic features and best shown in an electrocardiogram. But there is also a parietic difficulty, when convulsive contractions take the place of the normal ones. These are well shown by the above mentioned instruments of precision. Of the four principal signs, it will be noted that at least three are distinguishable without the aid of special instruments.

The signs in both auricular fibrillation and flutter are as follows:

1. A pulse deficit in which a large number of ventricular contractions are not felt in the pulse at the wrist.
2. Complete lack of co-ordination between the jugular and radial pulses.
3. Great variation in strength between the beats, best shown by the electrocardiogram.
4. Complete lack of uniformity between the interventricular intervals.
5. Usually a rapid action of the heart.
6. Control of this condition to a large extent by digitalis or strophanthus.

The fluoroscope will also show dilation of the auricles at first, before the contractions which follow the use of suitable medication. Similarly, the roentgenogram will in some instances demonstrate a dilated auricle satisfactorily. In doubtful cases, by comparing the electro-

cardiograms or polygrams in question with the normal types as shown in Figures 1, 2 and 3 one should be able to differentiate auricular-fibrillation in the light of the first five differential signs above given.

The polygraph, however, is in my opinion, the best single instrument, on the whole, available at the present time for interpretation of these and other cardiac anomalies, if in the hands of an expert. It is especially valuable for clinical work. The electrocardiograph combines the use of electricity and photography, and is essentially a laboratory machine; and yet it has the advantage over most polygraphic machines that it operates automatically, and registers normal and pathological conditions in auricular contractions more definitely than the polygraph. Neither of them, however, furnishes a record that is absolutely correct in point of time. We usually judge of the auricular rate by the jugular, and in so doing, the interval of time lost is normally about 1/10 second, with a further loss attributable to the mechanical operation of the instrument, that is from 1/10 to 1/5 of a second. In an electrocardiogram the contraction of the ventricle is heralded by contraction of the papillary muscles, which is apt to be in normal cases, 1/20 of a second in advance of the actual contraction of the ventricular walls, as a whole. It may be noted here that in the author's automatic spring recorded, the ventricular waves are contemporaneous with the beats of the radial pulse, but the principle on which it is operated differs from that of any other machine.

one has to face in the interpretation of all polygrams and electrocardiograms. In this connection, it may be interesting to know that according to Crane (*Am. Jr. of Roentgenology*, Nov. 17), auricular fibrillation can sometimes be differentiated by the X-ray.

The reason is that the auricle in this condition, as has been said, is almost immobile, and distended, but yet if the individual is too fleshy, cannot be put in the horizontal position, or if there are deposits in the thorax, the radiogram may yield no satisfactory information. Doubtless, however, the possibilities of radiography in this regard have not been reached. It is interesting to know that Dr. I. Seth Hirsch, of this city, has been able to secure pictures showing both auricular movements and distention.

In the vast majority of instances, a diagnosis can safely be based on the entire lack of uniformity in time between the interventricular intervals. This particular point is best determined by either an electrocardiogram or a polygram.

In the prognosis, we must bear in mind that auricular fibrillation may be transient, never returning; or on the other hand, it may be chronic and incurable; and that the prognosis apparently bears largely on myocardial efficiency. In the acute infections, such as diphtheria, fibrillation may disappear as the infection diminishes. But if there is a neoplasm or rheumatism, a syphilitic or fibrotic deposit, entailing any permanent change in the integrity of the auricle or its operation, the disease

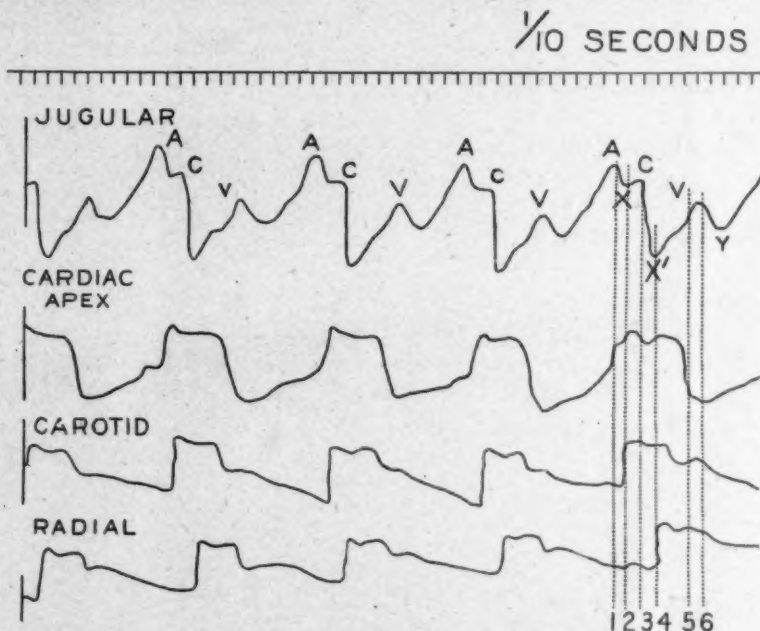


Fig. 2. Scheme showing graphically contemporaneous tracings of the jugular, apex, carotid and radial beats.

In the jugular tracing, A represents the auricular wave, C the carotid wave, V the ventricular wave. X denotes auricular relaxation; X, auricular diastole, while Y indicates ventricular diastole. The dotted lines marked with numerals indicate the contemporaneous waves and depression of the various vessels.

Of course, we must realize that in graphic tracings the strokes that represent the contraction of both auricles and ventricles are always composite, being made, upon the one hand, of the two auricular contractions which are not quite simultaneous, or of those of the two ventricles, which also contract separately. Such are the conditions

will continue. And yet, if by suitable medication the abnormal subjective conditions, such as the precordial pain, tachycardia, weakness and sleeplessness, are relieved, the patient may, except for an intercurrent affection, lead a fairly comfortable life for some years. The prognosis also depends on whether the patient will bear the medication and keep it up.

By the use of strophanthus and digitalis, the auricle is slowed up so that it has a chance to rest. In the treatment, the primary aim should be to reduce the pulse rate to the normal and the dosage of these drugs should be sufficient to hold the pulse down. Digitalis depresses

the activity of the conducting tissues and in this way accomplishes the desired result. Continuous medication, however, is absolutely necessary, but it is of paramount importance that that drug shall be of a form well borne by the stomach if the treatment is to be prolonged. At the same time, heart pain can be relieved by glonoin in 1/50 grain doses and sleep can be produced by veronal in 5 grain doses. After temporary relief has been obtained, one should always try to reach the underlying cause. If there is reason to believe that there is syphilis or rheumatism, the iodides, mercurials or salvarsan, should be given to the point of toleration. In transient auricular flutter, digitalis is a doubtful remedy. In some cases possibly it may do more harm than good.

In the differentiation of auricular fibrillation, we have to distinguish it (1) from sinus arrhythmia, which

is bined. In the first instance, the impulse, instead of originating from the sinus, starts from some other part of the auricle. In the latter, it starts from some part of the ventricle. For example, in mitral disease and dilatation of the left auricle (as in myocardial disease, causing dilatation of the heart chambers) this condition might cause the impulse to develop from the dilated part of the auricle. On the other hand, failing compensation causing failure of the left ventricle, could cause the auricular fibrillation to assume the ventricular type, or (as in one of my cases) it might cause ventricular fibrillation.

Subjectively, the signs of extra-systole are a sudden thud in the chest, perhaps with a sense of acute pain. Also, as the normal rhythm is interrupted, the extra contraction will be heard over the heart and felt by the finger on the pulse. But the distinction between the extra-systoles of auricular or ventricular types can only be detected by the electrocardiograph or polygraph for they, only, can distinguish clearly the peculiar complex of waves in the auricular form and the long compensatory pause of the ventricular form.

Fig. 3—Diagrammatic representation of a normal type of electrocardiogram as contemporaneous with normal types of carotid, aortic, auricular and jugular tracings; showing also their relations in point of time to the heart sounds, and the duration in fractions of seconds of their various activities. The lettering of the polygrams and electrocardiogram in Fig. 3 are those now accepted as standards in this country. Their significance is noted in the descriptions of Fig. 1 and 2. Constructed from the schemes of Frey, Mackenzie and Lewis.

This illustration gives a fairly correct view of the contemporaneous happenings in the different cycles, though, there is such a variation in any individual in the length of the cycle and in the prominence and position of the waves and depressions that no one of the tracings can be considered as more than approximately correct, in its relation to any one individual tracing.

Sometimes, and often, the extra-systoles are caused by the pressure of gas on the heart externally or from the use of tea, tobacco or coffee. Then the sharp stroke after the long pause will give an unpleasant nervous sensation, but the danger to life is inconsiderable. However, it may call attention to matters of more importance, for it is apt to be associated with other heart anomalies. Extra systoles are not common when the pulse rate is over 100.

(3) In heart block there is as a rule the slow arterial pulse as compared with the venous. In very exceptional cases only, it has been as high as 70 (Manges). It may be partial. In complete heart block where there is no fixed time-relation between the A wave of auricular contraction and the C wave of the carotid (See Fig. 2). The two heart chambers are seen to beat independently of one another.

(4) In Adams-Stokes disease, the loss of conductivity is associated with syncopal attacks. When the pulse rate varies around 30 to 40, the patient should be given a 1/60 grain of atropin. This eliminates the vagus action, when as a rule the slow ventricular rate will tend to rise toward the faster auricular rate. Heart block may be caused by syphilis, fibrosis and neoplasms and as its causes may be the same as those of auricular fibrillation, one form of arrhythmia passing over to another. This condition may also be produced by pressure on the vagus in its course or at its root, as in a case of mine with hemorrhage at the base of the brain. Acute infections, such as diphtheria and typhoid also cause it. If the

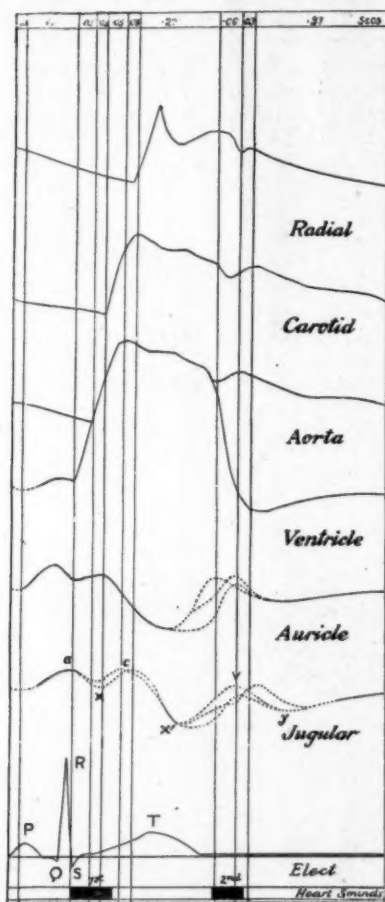


Fig. 3.

represents merely a variation from the normal within physiological bounds. This is a temporary affair and may be caused by forced respiration or swallowing, soon subsides, and can be inhibited by 1/60 grain of atropin, which depresses the action of the vagus; (2) Extra-systole arrhythmia, which is an example of irregular action in the cardiac chambers, where extra, i. e., intercurrent systoles take place. They are of varying types. In the auricular form, the entire complex as shown by the polygram is small. The compensatory pauses are also short as compared with those of the ventricular type where the length of the pause is about one-half of the preceding and following pause com-

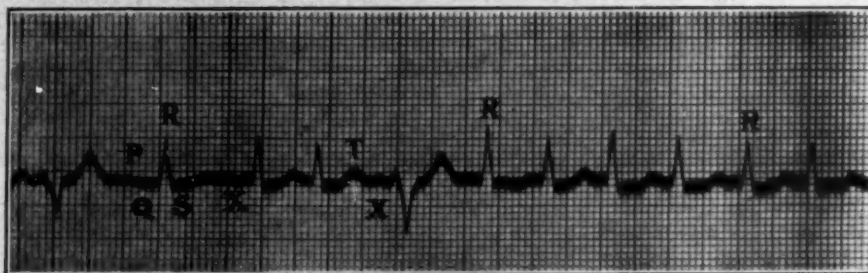


Fig. 4. Auricular Fibrillation as shown by an Electro Cards and Spacer.

block is relieved by atropin, the cause is functional.

(5) Ventricular fibrillation is extremely rare. The case recorded by me (*Diseases of the Heart and Blood Vessels*, 1918, p. 34) was, I believe, the second on record. The normal interventricular waves in this form of arrhythmia are supplanted by a series of large waves of a peculiar character. This patient of mine had failing compensation and I am disposed to believe that we shall find it not uncommon in the heart agony of approaching death.

(6) Pulsus alternans is the last of the arrhythmias from which we may be required to differentiate auricular

sary for a differentiation diagnosis, as already given are held in view.

The following are illustrative tracings:

Aortic stenosis. Mitral regurgitation, tachycardia. Lead II. No definite P wave. Interventricular time completely irregular. XX. Extra systoles of various types. T waves variable. R waves of varying force. Larger intervals $1/5$ sec., smaller intervals $1/25$ sec. (Electrocardiogram by Dr. H. J. Spencer, New York Hospital.)

Fig. 5—Adams-Stokes disease where the arterial pulse was 36. Fibrillation in the space X at the rate

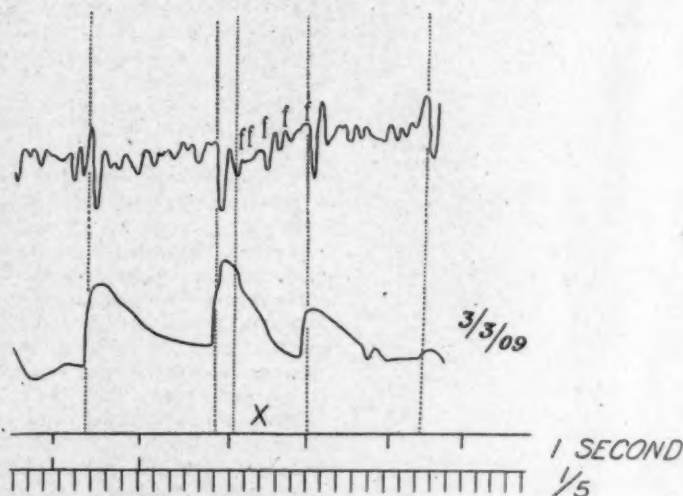


Fig. 5. Auricular Fibrillation as Shown by a Polygram.

lar fibrillation. We can, in well developed instances, detect this condition by the fingers, but it is always shown if present, with definiteness by the electrocardiogram or polygram.

By comparing electrocardiograms or polygrams with the normal types, as seen in Figs. 1, 2 and 3, a diagnosis of auricular fibrillation can be made, if the criteria neces-

of approximately 300 to the minute, as shown by the larger wave. The lower waves are those of the author's spring recorder. These waves are synchronous with the radial pulse. The upper waves are those of the jugular. If the smaller waves were reckoned in, the case would be one of auricular flutter. By the author.

Relation of Fistula in Ano to Tuberculosis.

Harvey B. Stone, of Baltimore, discusses the relation of fistula in ano to tuberculous infection, taking up the following points:

1. Is any fistula definitely and specifically a tuberculous lesion?
2. Is any fistula definitely and specifically not a tuberculous lesion?
3. If both of these questions be answered in the affirmative what proportion of fistula cases is definitely tuberculous?
4. What proportion of fistula cases is probably but not definitely tuberculous and on what data is this determination made?

He reviews the literature on the subject and on the basis of

reported cases and his own, considers the evidence for and against the tuberculous nature of fistula and their relation to other tuberculous foci. He summarizes his conclusions as follows: It is probable that definite tuberculosis cannot be demonstrated in more than ten per cent. of all fistula.

In a much larger percentage there is some relationship between fistula and tuberculosis and in perhaps 15 per cent. to 30 per cent. of all cases this relationship is fundamental and not merely coincidental.

Various theories have been advanced to explain this relationship but none have been proved.

In a considerable but at present inestimable percentage of cases there is no relationship whatever between fistula and tuberculosis.—(*Am. Rev. Tub.*, 1917, Vol. 1, No. 9.)

DOES ANALOGY EXIST BETWEEN ANIMAL AND VEGETABLE TUMOR?

EDWARD PERCY ROBINSON, M. D.,
New York.

All discoveries and inventions man has brought to perfection and usefulness are from the combined ideas and theories of several minds. Assemble these ideas and theories in the proper manner and the thing discovered or invented becomes a unity created from complexity. No man can be credited with having alone discovered or invented anything since his accomplishment depends upon the priority of scientific truths brought to light by minds working, perhaps, in channels of thought far removed from the theme pursued by the discoverer or inventor. It is hardly necessary to prove this by instances, yet an example may be cited. The discovery of wireless telegraphy would not have been possible prior to the hypothesis of ether. And so on *ad infinitum*. If, in the pursuit of facts upon which the cause of cancer may be placed, all that is known be gathered and sifted, it is probable that a few kernels of truth may be winnowed from the chaff of theory and superstition. And from these kernels may spring the real truth of which there can be no denial.

In the *Annals of Surgery* for April, 1918, Drs. Levin and Levine have presented an estimable article on "The Biological and Clinical Evidence of the Therapeutic value of Radium and Rontgen Rays in Cancer." They discuss the action of light from these sources in inhibiting cell proliferation; and this phenomenon may be well regarded as a clue of value in seeking the truth; because it demonstrates, at least, that cancers grow. The next move in the line of sequence is to discover the cause of growth.

The portion of the article which prompted this contribution is that dealing with the results obtained in creating a tumor artificially by the injection of a culture of the bacterium *tumefaciens* in a ricinus plant. This experiment seems to have led to the conclusion that tree-tumor is identical with that in man. And their belief in this is further strengthened by the experiments and researches of Dr. Erwin F. Smith of Washington as shown by the following quotation: "Crown gall is a tumor-like formation found on a great variety of plants. Dr. Smith, who studied the condition continually for the last ten years, is of the opinion that the disease is completely identical with animal and human cancer. Moreover, from the fact that crown gall is a parasitic disease he deduces the theory that animal cancer is also a parasitic disease."

But this ingenious experiment does not furnish sufficient proof that tree-tumor is identical with animal tumor. Grounds for such a belief would have been conclusive if a similar experiment on an animal had produced similar results. But in all the countless ages in which parasites have preyed upon the animal kingdom, and have bitten the different species and sucked their blood, bored holes in their hides and laid eggs to hatch therein, not one case of tumor has developed from such ravages which in the slightest degree resembles the true characteristics of a pathological tumor found in man or in any of the lower animals.

It has been settled beyond dispute that tumors are not exotic growths but that they arise from the tissues in which they are found, and are composed of the cells of those tissues. This incontrovertible fact must apply to the plant as well as to man. Ehrlich claims that "A tumor in order to grow continuously in an animal requires certain specific substances which permit of its

growth, the nature of these substances being unknown; if they are not present the tumor does not grow; when they are exhausted the tumor undergoes spontaneous regressions. If we are to accept this as an axiom applicable to both animal and plant life, one naturally wonders why a crown gall ceases to grow after reaching a certain size, and what was the nature of the specific substances which started its growth?

It is necessary to assume that a cell cannot grow independently of the plasma which nourishes it, and that the growth of the crown gall must have been brought about by some specific substance or substances introduced into the sap of the tree, the sap being analogous to the plasma of the animal. Did the fly, *cynips gallae*, inject the tree or merely puncture the bark and lay its eggs? And did the tree increase the cell activity of its cell proliferation to accommodate the fly, or was this done as a natural means of protection to wall off the invading parasite? The answer to these inquiries are not given in explanation of the formation of tree-tumor.

Tumors are created by a proliferation of pre-existing cells, and it is essential, if proliferation is to continue, that an over-abundance of plasma (or of sap if in a tree-tumor), be supplied to the site in which an excess of cell growth takes place. Therefore the first step in this process must be one of hyperemia. The view taken by the writer of this physiological process is as follows:

The blood is the protective medium of the animal body, as is the sap of a tree. In order to render protection it must be propelled toward the region to be protected. The sudden arrival of an excess of blood to any part of the body is a phenomenon not capable of explanation unless the property of intelligence be attributed to the cells engaged in the operation. Be this as it may, something incites the process and the act of irritation of the cells seems to be essential to bring it about.

There are three ways in which irritation may be made possible, namely by thermic, chemic or traumatic influences. There are also three ways in which the cells endeavor to rid themselves of irritating substances foreign to their environment, namely, by absorption of the agent, expulsion or by encapsulation. The writer thinks that the cell tries the process of absorption first. However, having failed in two means, the last and only one left is attempted, which is encapsulation. In any of these cases an excess of blood to the part is the first step. This first stage may be termed that of hyperemia, a little further advanced and it becomes a congestion, still further and the term inflammation is applied to it. Of course it is to be assumed that these phenomena which occur in the animal are also capable of analogous demonstration in the plant.

If the artificial tumor produced on the ricinus plant be taken as an example, an attempt of all the three methods mentioned in their respective order may be assumed to have occurred. And as the plant could not absorb the agar culture of the bacteria *tumefaciens* injected into its bark, nor expel it by suppuration, since plant life has no equivalent for the laudable pus of the surgeon, it was compelled to take the last and only step and thus encapsulate the invading organisms.

Where can we find a better example of this than in the oak? In this species of oak (*Quercus lusitanica*), the fly (*cynips gallae*) punctures the bark and deposits its eggs where they hatch; and as soon as the young grubs approach metamorphosis they bore a hole through the tumor-like mass that housed them and escape as flies. The act is one of self preservation on the part of the tree, and preservation of its progeny on the

part of the fly. The tree suffers and recovers and does not die from cancer. The fittest will survive. If this species of oak cannot resist the ravages of the fly it must die, and the parasite will find another host. Or the tree will develop some substance toxic to the fly and so save itself.

However, compensatory resistance seems to have been safely balanced since the process has been repeated from year to year for ages, and today serves man as a fruitful source in obtaining tannic acid.

Tumors in trees are possible only during the period in which the sap is "running"—spring and summer—more possible during the spring, for at this season the surface cells of the tree are young and being tender are more easily punctured by parasites. At the site of puncture there must be an accumulation of sap in excess of the normal flow if increased cell proliferation is to be accomplished, for the reason that the cells are dependent upon this fluid for their growth. The sap in the tree must be considered analogous to the blood of the animal. And while it is possible for a tumor to develop in an animal late in life, it is not possible artificially to create a tumor in a tree during its dormant period, or the period in which the sap has ceased to flow. There seems to be a clear point of differentiation between the etiology of tree-tumor and animal-tumor. The former cannot be produced by the cells of the old bark, but require young cells for this function. While, in the latter, old cells are particularly susceptible to tumor or fibrosis. In any event a hyperemia in the animal, or an excess of sap to some part of a tree, is the initial step, which must invariably occur before an excess of cell growth is possible.

If an exact comparison is to be made between tree-cancer and animal-cancer, the factors which produce the disease in one instance should be operative in the other. It will not do to take any one feature which is present in both kingdoms and assume other causes as being equal in both. If there is no distinguishing difference between the cells of the protophyta and those of the protozoa then there should be no difference in their behavior to the same stimulus. To establish their analogy it suits Drs. Levin and Levine to say that "A cycle consists in every plant and animal of youth, or period of development, maturity, or period of function; and the senility, or period of degeneration." And biologists lend their support to this statement by declaring that, "Every living thing has been evolved from a minute particle of matter in which the most critical tests of science are unable to discover the slightest resemblance, outline or suggestion of the adult which is to arise therefrom." Therefore, everything being equal, we should by the injection of a culture of the bacterium *tumefaciens* into the tissues of an animal be able to produce a tumor identical to that produced in a tree by the same medium. But this has never been accomplished. And it is strange that the numerous anti-toxin serums, and serums containing the bodies of dead bacteria, or virus of living bacteria, or inoculations of *spirochaeta pallida*, or any pus germs, for that matter, which have been artificially introduced or which find their way into the blood and tissues of the animal, never produce a cancer. Were this otherwise every vaccination would produce a cancer eventually; but even here a cancer seldom develops in an old scar caused by vaccination. And it is even more remarkable, when it is realized that bacteria have been existing with man ever since man was, that the human race has survived the ever-present danger of cancer. One can hardly resist the temptation to ask why it is that cancer is al-

most unknown among certain aborigines, or by what means do savage tribes protect themselves from cancer, who live in the wilds surrounded by parasites of tropical origin, and bacterial flora rampant in unsanitary surroundings? But the fact remains that in these regions cancer is unknown. Nor does cancer seem to affect the animals living in similar environment, and if, according to Dr. Smith, cancer is due to parasitic origin it should be common in those animals unfortunately predisposed to act as hosts to certain species of parasites; as, for example, the caribou. This animal is attacked by a parasite which burrows into the hide, leaving long furrows which serve as nests for eggs. The tissues become hypertrophied and openings exist in the skin showing the point of entrance or exit of the insect. And yet, despite these mutilations, which are practically kept in a chronic state of inflammation, by the efforts of the animal to rid itself of the pest by rubbing against trees, etc., the caribou is not a victim of cancer. An excellent pathological specimen of this parasitic action in a stuffed caribou may be seen in the New York Museum of Natural History.

In man the disease known as trichinosis should serve as a suitable starting point for cancer, if the parasitic theory were proved, from the fact that swelling of the infested muscles is analogous to tumor formation, and yet the phenomenon does not pass into the stage of cancer degeneration.

In the varieties of elephantiasis the pathology is characteristic of tumor formation, and the symptomatology is capable of differentiation in each. For example (to mention a few instance only), in elephantiasis telangiectodes there is a circumscribed hypertrophy of the skin and subcutaneous tissue, and which may hang in folds similarly to dermatolysis. In elephantiasis arabum the enormity of the hypertrophied tissues, especially in cases where the leg is the seat of the trouble, would lead one to wonder why the tissues never become cancerous.

Another parasite whose invasion of the tissues produces great swelling and deformity is the *sarcophylla* (*dermatophilus*) penetrans, better known as the chigo or jigger. This is a sand-flea and a habitant of the tropical regions. It burrows in the hands and feet and deposits its eggs there to hatch. The writer has seen a case of this affection in a negro, a native of Barbados, B. W. I., in which all of the toes of both feet had suppurated away, and the burrowings of the flea had penetrated to such an extent that a Chopart's amputation of both feet was seriously considered as the most appropriate means of affording relief.

But of all parasitic disease, from which cancer might arise, we should be lead to assume that malarial subjects ought to be most prone to develop it, for here we have an enlarged spleen, which may be theoretically looked upon as a tumor, and the cachexia which so closely resembles that of cancer, and yet malignancy is not any more frequent in malarial patients than in others.

In the past decade the improper use of paraffin and vaselin by subcutaneous injections in the corrections of certain defects of the face, from the standpoint of cosmetic prosthesis, has been the means in thousands of cases of creating hard nodules of various sizes in the tissues of the face and other regions of the body into which it has been injected. The coined word *paraffinoma* has been applied to such tumors, and yet there is no instance of this type of growth becoming malignant. Injections of tincture of digitalis, or of

camphorated oil, are sometimes followed by induration of the tissues.

From the investigations made by those favoring the parasitic theory of cancer, it would appear that the findings were sufficiently forceful to explode the notion, not only of this theory but the assumption that bacteria are instrumental in causing cancer.

Experiments have demonstrated conclusively that cancer cannot be artificially produced. Inoculation of the filtrate of macerated cancer tissue has been ineffective in producing cancer. In like manner the attempts to graft portions of chicken sarcoma have not been constant in success, and even in those cases where the graft did grow it could not be assumed that the constitutional dyscrasia had also been introduced in the host. And to help out any theory as to the possibility of transferring cancer from one subject to another it is necessary to suggest a predisposition to the disease.

In the experiments conducted by Dr. F. C. Wood on explants or tissue cultures, he makes mention of the fact that, "When the tumor is ground up and passed through a Berkefeld filter No. 5, which is impermeable to *B. prodigiosus*, the resulting fluid is capable of giving rise to a new tumor when inoculated into a susceptible fowl. The obvious interpretation of the phenomenon is that the tumor is transmitted by an invisible and filterable virus." *E. P. R. Med. Rec.*, Sept. 1, 1917.) To create a new tumor, however, it is necessary that the fowl be susceptible. This filterable virus had been subjected to a temperature sufficiently high to destroy all organic life. From the technique employed in this experiment it can be inferred that no living organism existed in the filtered fluid and that the virus was of a chemical nature.

Dr. Wood seems to infer that the filterable virus is not of a chemical nature. But if a material substance is not organic it must be inorganic; and under this heading it can be considered as chemical. This experiment, however, gives a valuable clue, unfortunately overlooked by the doctor. It is a kernel of truth and from it can be created a hypothesis on the physico-chemical nature of cancer. If there is no confirmative evidence to show that cancer is caused by parasitic or bacterial influences, it would be neither unwise nor unscientific to drop further discussion of the cause of cancer from this premise and take it up from some other point. This the writer attempted in an article which appeared in the *Medical Record* for September 1, 1917, and from which the following abstracts are taken.

"The initiative stage of cancer is that of hyperemia, occurring in any part of the body, and caused either by traumatism or toxic products from bacteria or chemical substances. The next step is the passing of the hyperemia into an inflammation. As inflammation is the first step in physiological repair this function becomes operative and is manifested by the process of proliferation of the cells involved. In the normal processes of repair the cell division is perfect and uninterrupted, and proliferation and growth continue onward until healing is completed. But if there exists in the blood a condition which might have the effect of stimulus, a formative stimulus, as it has been conjectured, the physiological processes of cell division become disturbed and irregular, the cytoplasm no longer dividing with the nucleus, and the result is a giant cell. A single organism can grow and develop only up to a certain point, limited by its degree of specialization. That further progress may be made, the individual life must cease and give place to a successor." If one is to believe this fundamental truth as expounded by Prof. F. H.

Pike, it is evident that a giant cell has lost its degree of specialization and is incapable of further proliferation and growth and must be without progeny.

Statistics were given to show that those organs having a large blood supply, or those physiologically active in metabolism, constructive or destructive, are more liable to be affected with cancer than those not so highly vascularized. The greater proliferative capacity of the female as compared with that of the male is thought to be the cause of the higher percentage of cancer in women than in men.

Excluding all other causes, traumatic or bacterial, and considering the chemical influence solely, it was assumed in the hypothesis that the active and predominant cause of cancer lies in the excessive use of sodium chloride or common table salt. That there might exist in certain families idiosyncrasy for the use of sodium salt led the writer to infer that the prevalence of cancer in such families was due to this idiosyncrasy, and not to any particular hereditary tendencies to cancer capable of transmission from parent to offspring.

The writer stated that traumatism was an inciting factor, yet not the direct cause of cancer; in other words, it serves merely to kindle the hyperemia. In so far as proliferation is the first step in the repair of tissue, it might be reasonable to assume that malignancy might be instituted in the cell at the time that mitosis was taking place, and, instead of the division being physiological and regular, the cytoplasm did not divide with the nucleus but produced a degenerate cell.

In the *Medical Record* of February 9, 1918, page 258, it is noted that "MacCarthy believed the disease to begin in the waiting or repair cells," and Dr. Charles H. Mayo remarks that, "We thus saw how the stimulation of continued traumatism might stimulate to activity such repair cells when lack of control, differentiation and migratory hyperplasia would place them within the cancer classification." Mayo is further reported as saying, "Nearly one-third of the cancers that affected man were found in the stomach where acidity was constant and high. The duodenum which by right of continuity of tissue, close association with an opportunity for grafting, and apparently far more commonly affected by ulceration than the stomach, was almost never affected with cancer, which, however, spread into all other tissues around it when developed from gastric cancer."

The importance then of the constancy of acidity in cancer should be borne in mind as being of the utmost importance with its relation to sodium chloride in the plasma and tissues. For the existence of hydrochloric acid in the gastric juice depends altogether upon the sodium chloride ingested with the food. An excess of this acid must be due to an excessive use of common table salt; for it is not known that the body can obtain chlorine from any other source.

Now on this hypothesis the writer advocated the employment of a drug which would displace the irritating sodium chloride from the cells and thus permit of their regression, and on May 4, 1918, an article by him appeared in the *Medical Record* under the heading, "A Plea for the use of Potassium Nitrate in the Treatment of Cancer." This article gives an exhaustive discussion on the chemistry of the displacement of sodium chloride.

It is too soon for the writer to declare that potassium nitrate is an antidote and a cure for cancer, but the remarkable instances of improvement in incurable cases of cancer in the short time in which a limited number of patients have been under the administration

of this salt, cause him to feel that not only has the cause of cancer been discovered but also its prevention and cure. There is one case in which a diagnosis of cancer of the stomach was made by three physicians, where all symptoms of the disease have entirely disappeared and the patient considers herself cured. This patient was given doses of one-twenty-fifth of a grain of potassium nitrate, dissolved in four ounces of water, every three hours.

Other cases of cancer affecting different regions of the body have shown marked evidences of improvement. But in a disease, such as cancer, in which the cells have reached the maximum point of degeneration, taking years to bring about this metamorphosis, it would be very unreasonable to expect any positive regression until treatment had been continued for an appropriate length of time. If, however, there is evidence of improvement then there are grounds for assuming that a cure will be effected. Confirmative evidence of this statement simply awaits verification by those physicians and surgeons who are willing to set aside any scruples they may have toward the adoption of a new method of treatment and try the drug potassium nitrate, bearing in mind that the object sought is a cure, irrespective of the means employed.

452 Fifth Ave.

IMPORTANCE OF REPORTING VENEREAL DISEASES.

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The compulsory measure of reporting venereal diseases, as a protection during the war crisis period would seem of great importance, not only as a protection to the national man power, but maybe as a useful test for making this precaution a stable law with all of the state boards of health.

During many years acquaintance, as a specialist in genito-urinary diseases, with this fearful menace to the human race, it has been frequently wondered at that legal supervision of this scourge has not, apparently, been considered just as necessary as that of small pox, diphtheria, scarlet fever and other contagious diseases.

It has also been thought that one reason why the immoral bearer of disease germs causes such widespread infection is that, like the mole, he is allowed to continue his operations and disease spreading under cover.

While it is quite true that it would be out of place to bring these unfortunate victims under public gaze, to placard their domiciles as places of infectious diseases, there might be a very decidedly beneficial influence upon the morale, provided the said germ spreaders are aware of the fact that their cases had been recorded with the state boards of health.

Not infrequently a very reckless person has been encountered who, because there did not happen to be distressing personal symptoms, seemed utterly regardless of the safety of others, in fact, the miserable threat has been heard that, as some individual had inconsiderately conveyed the infection to a revengeful male member of society, it seemed only in keeping with just vengeance that the said male member should pass on the contribution to others.

Very many of these individuals are totally irresponsible, because totally devoid of all moral sensibility, hence it should be of serious moment that legal influence be used, as far as possible in a free land, to cur-

tail the already too widely spread prevalence of an infection that is most damaging in its work.

A patient was asked—"What would you think of having your condition, as a victim of venereal infection, reported to certain state authorities?" "What, for anyone else but the attending surgeon to know that I am in this fix? I think that would be pretty tough. You are not going to report me, are you?"

"Conscience doth make cowards of us all"—and, most likely, under the impression of having to be reported to the state board of health, each time a venereal infection is contracted, possibly there might be very much less of the reckless exposure that the genito-urinary specialists now hear of.

Doubtless the ambitious producers of valuable toxins, even for the most persistent infections, will continue to put forward valuable remedies, but as we still know of the great virtue in preventive measures, it would seem professionally wise to try every possible, rational method to, in some measure at least, curtail the ravages of one or several of society's most destructive enemies.

It is lamentable, but very true, that complete restoration of man's moral health is outside of the domain of the medical profession. However, as modern society is now receiving a real good shakeup, as a result of a great war crisis, toward a more wholesome reformation of its order, much advantage may be taken of the occasion, for instituting some degree of restriction upon man's reckless, immoral habits, especially when in a pathological condition.

The claim has been made that, in a certain large southern city, where houses of prostitution are licensed, careful, frequent physical examinations of the inmates of such houses are successful means of preventing the spread of venereal diseases.

While such examinations, at frequent intervals, may pay the professional examiner fairly well, it is very reasonable to contend that when the individuals happen to be in the incubative stage of a venereal infection (there are no periods of "lay off" after a possible exposure) there can be no reasonable certainty of knowing whether or not the said individuals have become infected, or that there is a fair certainty against their spreading the infection in many directions before they are rounded up for treatment.

Hence, here we have another vicious influence at work, as a result of having to license prostitution.

It is quite true, nowadays, that very much is being accomplished—psychologically, at least, in satisfying public sentiment and many plausible theories "listen" well, especially when applied to conditions that are kept more or less under cover, but we must believe that it is the duty of the medical profession always to stand up for every possible means, in preventive measures, to combat the ravages of infectious diseases, more especially those that are so hidden away under the dark cloak of immorality as to render them difficult of detection.

Meningococcus Culture.

M. B. Cohen, West Salem, Ohio, finds that by using partial oxygen tension conditions in primary cultures, isolation of the meningococcus can be more readily obtained. It is a micro-aerophil, and relatively few meningococci are capable of aerobic growth. The growth ordinarily obtained by aerobic methods consists of those organisms—a small minority of meningococci—capable of adaptation to full oxygen tension. This explains why it is stated in many bacteriologic works that large amounts of exudate must be planted to get suitable primary growth.—(J. A. M. A.)

A RATIONAL PROCEDURE FOR THE EXTIRPATION OF HEMORRHOIDS.

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Only a few years ago the clamp and cautery were the chief instruments used in dealing with the problem of relief of hemorrhoids. This operation has practically passed out of usage.

At this moment one method of procedure holds nearly universal sway among surgeons aiming at a radical cure—the ligation with the intention of strangulation, amputating as much of the redundant tissue as can be done safely to insure that the ligature will not slip, and allowing the strangulated tissue that remains to die and slough away.

This method is effectual in that it successfully removes the redundant vascular tissue that is taken into the noose of tightly drawn thread. It has, nevertheless, many drawbacks inasmuch that I believe it too is destined to become obsolete. The Whitehead operation and the strangulation operations are alike in that they both contravene well grounded surgical principles.

The strangulation method has the advantage over the clamp and cautery methods in causing somewhat less cicatrization, thus usually stopping short of a permanent constriction of the anus, but the sloughing following the strangulation method is very serious. Saphraemia in some degree always follows, sapping the strength and shattering the nerves of the patient, while the offensiveness of the sloughing process adds anxiety and disgust to the burden of the sufferer. While it is well known that the ano-rectal tissues are resistant to infection, fatal infection is a possibility.

I have adopted a more simple and rational method. It must be remembered that this paper concerns only well-developed hemorrhoids with hypertrophied tissue and large arterial blood supply and not the small venous external tumors that can be treated by a simple slit to turn out a blood clot.

I usually work under local anesthesia, as the anal tissues are well adapted for injections, while certain disadvantages of general anesthesia for rectal operations are well known. A conscious patient can always assist by straining out internal hemorrhoids till they can be grasped by instruments sufficiently to manage. A wire snare and tenaculum similar to those employed in tonsilectomies are used.

The extent of the tissue designed to be removed is first marked off and then well injected with a weak solution of eucain. The mass is drawn down by the tenaculum and looped in the snare, and given to an assistant to hold, while he exerts sufficient pressure with the thumb to prevent the noose from slipping. A needle threaded with chromicized catgut is used to securely anchor a purse-string suture about the base of the hemorrhoidal mass on the proximate side of the wire noose. I then exert full pressure on the wire and thus eliminate the mass by the cold snare. This is usually done without the use of either scissors or knife, although it is frequently advantageous to first clip through the tough muco-cutaneous portion with sharp-pointed shears. The remaining hemorrhoids are then dealt with in turn.

The hemorrhage is then safely controlled by ligating with the chromicized catgut already in situ. In tying this purse-string suture, sufficient pressure is used to control the bleeding and no more.

Herein my method differs radically from the strangulation method which is to draw a strong linen thread as tightly as possible, both from the necessity of avoiding slipping and with the object of causing the death of the tissues which lie on the distal side of the cord. In my method a sufficient amount of tissue can be amputated at once, therefore further removal by the sloughing process is avoidable and sufficient circulation to allow all the part that is left after the snaring to live is practicable.

The results have been uniformly gratifying to me. Healing after wounding of the anal tissues is always a slow process, but in my method precisely as much time is gained in convalescence over the strangulation method as is required for the shedding of the sloughing portion—that is to say 6 to 10 days—since it is manifest that healing will not begin until the slough has been shed.

There is also a marked contrast in the comfort of the patient. I frequently do these operations at the patient's home, and on visiting patients twenty-four hours after operating I am sometimes met at the door by the patient in person and have been greeted by the remark, "Doctor, I feel so much better already." If five-day catgut is chosen, healing will be well advanced before it is absorbed. Post operation ulceration is thereby reduced and excessive cicatrization avoided. Defecation is fairly comfortable after this procedure and it is unnecessary to block the bowels by opiates or astringents.

This procedure may or may not have been done by myself alone, but, simple and rational as it seems to me, I have not yet seen it described by any one else.

In conclusion I wish to make a plea for better care and observation after amputation of hemorrhoids by whatever method employed. It does not appear to be sufficiently appreciated that hemorrhoids are the result of inflammation of the rectum and not the cause of it.

More or less proctitis will always remain after they have been removed and this inflammation may be soothed, and further trouble avoided by the local application of soothing antiseptics through a rectoscope.

I believe that these minor operations had better be undertaken by the proctologist and gastro-enterologist rather than to be turned over to the general surgeon.

Those dealing especially with bowel conditions usually have, and should have, a keener appreciation of the great influence over the whole system exerted by any derangement of these parts which are so completely under the sway of the sympathetic nervous system, and likewise a better grasp of its peculiar requirements of treatment than do those of our profession whose minds are necessarily diverted to larger fields.

253 W. 22nd St.

The Pathological Gall Bladder.

George and Leonard state that only when some pathological change has taken place in the walls of the gall bladder or its contents can its shadow be demonstrated on the x-ray plate. When the shadow of a gall bladder is "visualized" it must be pathological, by which they mean that either the walls of the gall bladder are thickened or that the bile content is of greater density than normal, or greater in quantity, or that it contains stones or calcium in some form. The authors further maintain that the operating surgeon cannot determine by simple palpation and inspection whether or not the gall bladder is normal, and that even if the gall bladder be opened, simple inspection of its interior is not sufficient to determine the presence or absence of disease. Only by removal of the gall bladder and microscopic examination can the absence of disease be made certain. Some workers have claimed that normal gall bladders are visible on the x-ray plate. To this it is replied that just as some "normal" individuals may show gall stones, so a few healthy persons may have technically pathological gall bladders without clinical symptoms.—(*Amer. Journ. of Roentgenol.*)

USE AND INDICATION OF ENDOSCOPY.

With Special Reference to the Author's Urethroscope.

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From time immemorial to the present, the forming of conception, of judgment and of reasoning has been made possible by the intermediary agencies of the five senses; namely, sight, hearing, smell, taste and touch. Some of these may be more keenly developed in the same individual than others, depending on the amount of exercise they are subjected to by the individual in the pursuit of his calling.

The physician must, in order to arrive at a correct diagnosis, have all senses intact. This is as true of the physician of today as it is of the one of yesteryear, who, for want of elaborate equipments, which he possesses today, had to depend solely on his five senses for a diagnosis.

But in the drift of time and in the progress of humanity, the physician has benefited by the various inventions calculated to remove the superfluous strain, and to enhance the perceptive and receptive power of the senses. The progress still continues, and tends to make medicine an exact, instead of a speculative science. It is scarcely necessary to enumerate all the devices, from the crudest form of stethoscope to the most modern one; from the primitive microscope to the most composite of today; various forms of electric apparatus for diagnosis and treatment, etc. Suffice it to say that the human mind has ever been alert to devise means to assist the imperfect senses. As a result of this, medicine has grown to such proportions that it no longer is possible for any one individual to master it all. Like a tree, it has given off branches; and these branches, like those of the tree, draw sustenance from the mother trunk.

Urology is one of these branches; and, like the others, it, too, grows luxuriantly.

Since the introduction of the urethroscope and the cystoscope to its domain, together with the application of the x-ray apparatus as a diagnostic aid, it became, on the tree of medicine, one of its most precise branches. Consequently one no more has to depend entirely on the clinical history for a diagnosis, but may with reasonable certainty, by visualization, lay his fingers on the lesion.

Adhering strictly to the title of this article, I shall describe only the indications of urothroscopy in connection with urethral diseases, and refer to the cystoscope, by way of digression, when describing the use of my own endoscope.

As long as gonorrhea is the most common affection of the urethra, this is naturally the most common indication for urethroscopy. The next question to be decided on is, in what stage of the disease shall it be resorted to? What is its purpose? Some physicians seem to think that, to daub the surface of the urethra with strong solutions of silver nitrate is its only object; and, when the results are either unsatisfactory or disastrous, they blame the method but not their judgment.

The function of the urethroscope is distinctly twofold: first, to make a diagnosis; secondly, to operate through the urethroscope, or clearly to point the way towards another form of treatment.

In the course of acute gonorrhea, when the use of all other instruments is contraindicated, that of the endoscope is also contraindicated. But as soon as the

acute stage, with its accompanying discharge, has abated to such an extent as to admit of instrumentation, then the endoscope may safely be used; in fact, at times, its use may be imperative. In the resolving stage of acute gonorrhea, whether the posterior urethra with its annexa be involved or not, the anterior urethra from bulb to meatus should be subjected to a urethroscopic examination, for many cases, whose annexa are involved, are allowed to lapse into the chronic stage, with its concomitant miseries, simply because the physician failed to inspect the urethra.

When one inspects the urethra he should keep in mind the color of the mucosa, which varies in intensity in the different portions of the urethra, being darker in the bulb than in the spongy urethra; then the elasticity, thickness, consistency and the striae of the urethral walls; the shape of the central figure or lumen of the urethra; lastly, one should look for glandular involvement, which can be seen only in diseased conditions; lacunar infections and invaginations, or diverticulae of varying sizes, which are not, at all, uncommon in the bulbous urethra, thus harboring infectious material indefinitely.

After having carefully inspected the urethra, one can easily adopt a mode of treatment best suited for the case. It is a wise plan to have a diagram of the genital organs mapped out on the history sheet on which, as near as possible, the anatomic location of the lesion may be designated for future reference; for only by comparing the urethral picture, as found on examination, with that found after a course of treatment can one judge the relative value of the treatment; and, then, if any change of treatment be warranted, it may be instituted. It will be seen, therefore, that the endoscope will have to be used oftener in the course of treatment, even, if for no other purpose than to study the progress of the disease.

It goes without saying that in chronic urethritis the use of the endoscope is absolutely indispensable, not alone for the anterior but for the posterior urethra as well. In such cases one may find a veritable panorama, from the sphincter to the external meatus; a view, ranging from pinpoint vegetations or granulations, to luxuriant excrescences; from soft infiltrations to fully developed strictures, cysts and chronic catarrhal inflammations, as manifested by a succulent and boggy condition of the mucous membrane. In short, in a given case, one may find all stages of evolution of urethral pathology.

By way of parenthesis, I may add, that in a surprisingly large number of chronic posterior infections, the colliculus seminalis is relatively intact, but, instead, the lateral prostatic sulci, the supramontane region almost as far as the sphincter, and the roof of the urethra, are in a state of diffuse inflammation, indicating the presence of follicular prostatitis; and one must inevitably come to grief by applying strong solution to the colliculus, or to the entire posterior urethra.

In cases of hématuria, one should never neglect to examine the urethra for possible sources of bleeding. It may come from many causes, notably, the most common among which is an ulcer behind a tight stricture. No other ulcer forms spontaneously in the urethra, except primary lesions, which, as a rule, are located in the foremost part of the urethra; secondly, tuberculous ulcers, in the last stages of urogenital tuberculosis, and these are usually found in the prostatic urethra, being associated with fine glistening, pearly tubercles, which resemble cysts; then there may be chancroidal and malignant ulcers, the former of which

I encountered once in my practice. Bleeding, following the breaking of chordee, is traumatic and not due to the gonorrheal process. It is noteworthy that in the course of gonorrhea, unless created by the strong hand of the physician, there are no ulcers found in the urethra. It is true that in some cases, even under the most gentle manipulation, it may be unavoidable, particularly in the posterior urethra.

This brings me to the consideration of the types of instruments to be used.

From the many varieties of endoscopes with which the market abounds, one may judge, without bias, of the imperfections and shortcomings of all. One instrument may possess certain advantages over another; the latter, on the other hand, offsets those by other virtues which it possesses over the former. Thus the human mind has been set to improve on such instruments whose usefulness is limited. The urethroscope has, accordingly, gone through various stages of transformation, from the simplest tube provided with imperfectly reflected light of a head mirror to the more logically developed electrically lighted instruments. The latter, too, have given rise to new improvement as a result of which every urologist with a well-appointed office has procured a variety of urethroscopes in order to meet every requirement.

Before discussing the relative merits of each type I shall, in a general way, outline the anatomic structure of the urethra.

The urethra is, as we all know, a collapsible tube of which but a small segment may be visualized at a time. It is made up radiating folds between which numerous lesions may be present and escape detection. This is especially true of large calibred and well developed urethrae, with prominent folds. Again there may be small sacculations in the urethra, more commonly near the bulb, which are readily missed unless distended with either fluid or air. The same is true, to a lesser degree, of the posterior urethra.

From all this it is evident that by using the ordinary straight type for the anterior urethra and the curved tube for the posterior, one is apt to overlook important lesions within hidden recesses in the anterior urethra and altogether unable to examine any other part but the floor in the posterior urethra, whereas experience taught me that lesions are very frequent in the lateral walls and in the roof of the posterior urethra.

These difficulties may be overcome in one of two ways: first, by the employment of an instrument adapted for the use of fluid as a distending medium, of which there are very ingenious instruments on the market, notably the Goldschmidt, Buerger and McCarthy cystourethroscope. They all are excellent for the posterior urethra as diagnostic instruments. Their usefulness, however, wanes in the anterior urethra, where it is necessary to obtain a concentric view of all the walls for possible strictures, etc. Another drawback of the irrigating urethroscope is that their use for therapeutic purposes is limited, so much so that Goldschmidt of Germany, the pioneer of the irrigating urethroscope, had given it up and replaced it by a new model, which is used like the old endoscope, having the telescoping arrangement outside of the tube.

Having tried to obviate all the difficulties which I learned from experience, I proceeded, accordingly, in the year 1911 to construct a model which would overcome many obstacles in the examination of the urethra. I published it in the *New York Medical Journal*, December 28, 1912, under the title, "A New Operating

Urethroscope." The accompanying diagrams will illustrate it.

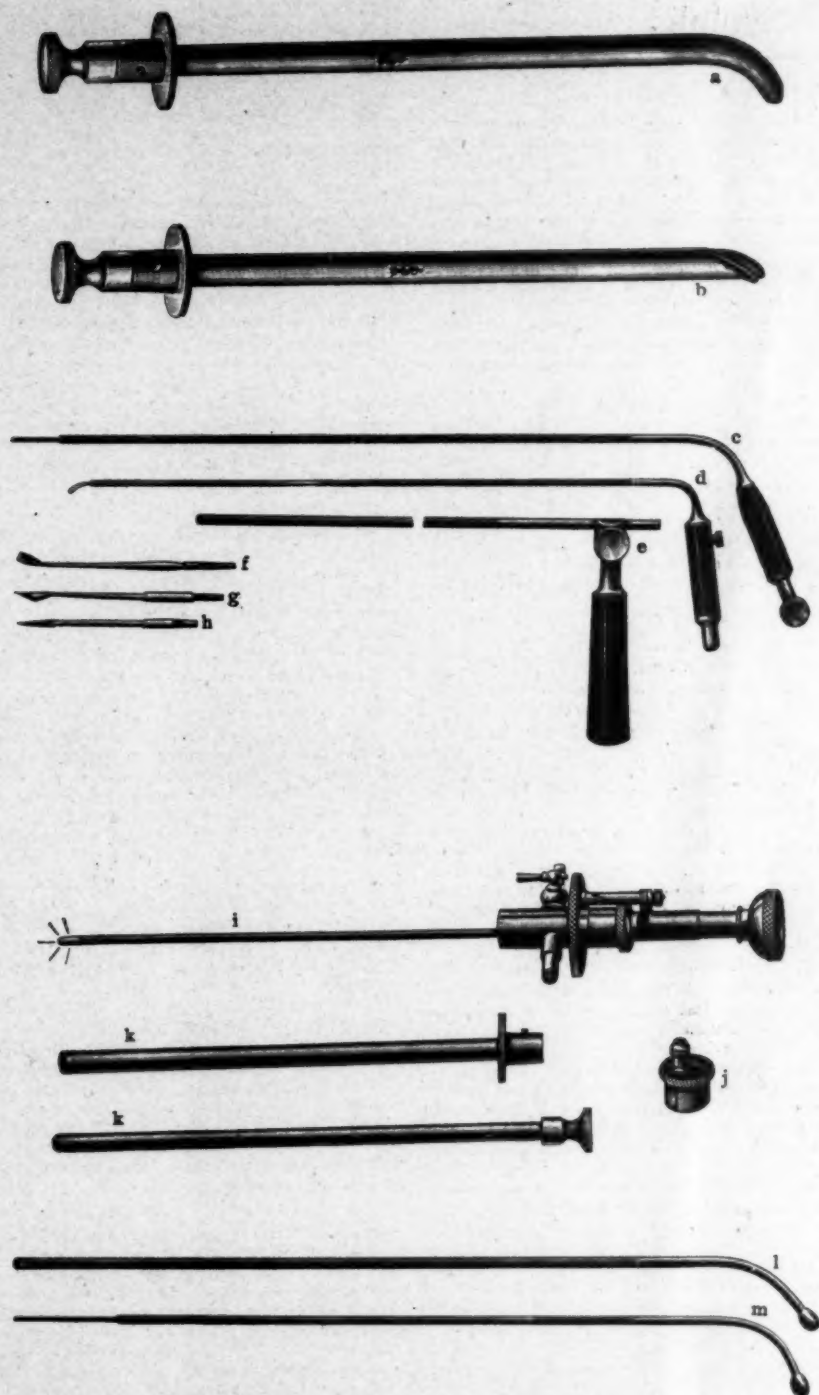
It is a composite instrument consisting of three tubes, a straight one for the anterior urethra, another straight one, a conical section of which was removed, for the posterior urethra exclusively, a third, curved tube, for the posterior urethra—a tube which I least often use—having reserved it for the use of those who wish to avail themselves of this instrument and prefer beaked endoscope for the posterior urethra. The light carrier is armed with a megaloscope, swinging on hinges from side to side, amply magnifying the visual field and capable of focussing for varying distances. At the base of the body is a socket into which one of two detachable light carriers fit, one, a long one, projecting into the lumen of the tube, thus illuminating brightly the object under view, and another, a reflected lamp, which fairly illuminates the interior, thus affording a larger operating field. From the side of the body a faucet emerges, to which either an air bulb or an irrigating tube is attached. To make the instrument air and water tight, it is provided with an observation window. In addition to this there is an operating window with a perforated hood, which may be tightened or relaxed at will for the introduction of various operating instruments through it. To the accessories enumerated in the diagram I added straight detachable sounds for the use in filiform strictures.

Modus Operandi—For the posterior urethra use the specially constructed straight tube and pass it directly through the internal sphincter into the bladder cavity, then remove the obturator. If any urine escapes, aspirate it with a special aspirator designed for that purpose, attach the air bulb to the stopcock which must be closed until used, and inflate the bulb. Now turn on the electric current, draw the endoscope just within the sphincter, and open the stopcock gently so as to allow just a little air to escape into the urethra, when the walls of both the urethra and the sphincter will be distended. Turn off the stopcock and swing the telescope into place. Examine the sphincter, the prostatic urethra and the membranous urethra in succession by withdrawing the endoscope and rotating it on its long axis. When the membranous urethra is reached, owing to the strong muscular sphincter, it may be necessary to discharge a little more air for a thorough inspection of the walls. The straight tube, designed for the anterior urethra, may also be used for the posterior and it is particularly useful to bring in relief the entire sphincter vesicae and the membranous urethra.

For the anterior urethra the straight tube is to be used. It is advisable to introduce the instrument a little way beyond the bulb, just within grasp of the compressor muscle, and view every segment, first without, and then with distension.

This urethroscope may be used as an irrigating instrument as well. When used as such, one must be guided by the same principles that govern the use of Braasch's cystoscope, i. e., to establish a continuity of the column of water within the bladder cavity with that of, in the lumen of the urethroscope. A fair view of the interior of the bladder can be seen, the ureters are easily made out. Thus one is able with the use of one instrument at the same sitting to examine the bladder and the entire urethra.

When one wishes to use any of the operating instruments under air or water distension then he must replace the observation with the operating window. The latter is provided with a perforated hood through which various instruments, as knife, curette, applica-



tors, cautery, fulguration electrode, sounds, filiform bougies and ureteral catheters, may be passed.

To sum up, I reiterate that in justice to the patient no urethral condition can be intelligently treated without urethroscopy and that urethroscopy does not necessarily imply promiscuous applications of caustic substances to the urethra, but rather to keep one informed of the progress of the disease and of any changes in treatment that may be warranted.

As to the type of instrument to be used rests entirely with the operator. Practically every good instrument to which one is accustomed answers the purpose. I do not claim for my instruments any advantages over others except in its being compact and serviceable for the examination of the entire urinary tract, at one sitting, admitting of distension either with air—bringing out the image without any distortion—or, with water, when it may be used like the Braasch cystoscope.

120 East 34th Street.

Syphilis

Reinfection in Syphilis.

Maj. Charles F. White, R. A. M. C., believes there is no such thing as a natural immunity from syphilis. However this may be, it was held until recently that immunity from syphilis might be acquired. The older theory, now abandoned, was that one infection of syphilis produced immunity from further infection; in other words, that syphilis could be acquired once only in a lifetime. Careful investigation appears to establish—

1. That reinfection can take place.

2. That such reinfection cannot take place until the original infection has been completely cured.

With the older treatment of syphilis a complete cure was difficult, or very rare, and consequently cases of reinfection were so exceptional that a doubt of their existence was not unreasonable.

The collection and examination of instances of reinfection are therefore of great importance. First, as showing beyond doubt that reinfection is a fact, and, secondly, as amounting to almost complete proof of the cure of the first attack.

Since the introduction of the combined salvarsan and mercury treatment for syphilis the number of cases of genuine reinfections reported has increased—a sure sign of the curative efficacy of this treatment and a proof that one attack of syphilis does not produce immunity. Perhaps we should not be far wrong in saying that the only persons immune from syphilis are the syphilitics.

Formerly proof of reinfection was based on clinical evidence alone and was open to certain fallacies, namely:

(a) *In the Case of the First Attack.*—Absence of positive proof of syphilis in those cases in which treatment was started in the primary stage and in which secondary symptoms did not develop. As no microscopic examination was made, or in the failure to find spirochaetes in serum from the sore, it was always possible that the diagnosis was mistaken. In other words, there was no positive proof that the chancre was syphilitic and not a soft sore.

(b) *In the Case of the Second Attack.*—(1) A soft chancre, (2) a recurrent chancre, (3) a chancreiform gumma, or (4) a pseudo-chancere (that is, a mucous genital syphilide which may have undergone induration), being mistaken for primary syphilitic chancres, or (5) the recurrent rashes being perhaps put down as fresh secondary syphilides and regarded as proof of a second attack.

Since the discovery by Schaudinn and Hoffmann of the *Spirochaeta pallida* as the cause of syphilis and the introduction of the Wassermann serum test as an aid to its diagnosis and cure, positive proof of reinfection can in certain cases be given apart from the clinical evidence.

We may lay down the following conditions:

1. In the first attack, *Spirochaeta pallida* being found from the chancre or syphilitic lesions (condyloma, mucous patch, or rash) or the blood giving a positive Wassermann reaction (here we must exclude the positive Wassermann of cases of hereditary syphilis); and

2. In the second attack, *Spirochaeta pallida* being found from the new chancre which appeared at a different site from the first chancre, and the blood at the same time giving a negative Wassermann reaction, which of course implies that the patient must have been seen shortly after the appearance of the second chancre, or at least before the blood had had time to become positive.

If we can produce cases to fulfil the above conditions, we have very strong confirmatory evidence apart from our clinical observation and opinion that reinfection has actually taken place.

A few from many cases of reinfection (Series I), which were all seen and treated by me during both attacks, fulfil the above conditions.

SERIES I.

CASE I.

First Admission (December 1st, 1915).—The patient was admitted to hospital with (1) a primary papular erosive syphilitic sore at the fraenum, (2) adenitis in both groins. There was no other visible sign of syphilis. The period of incubation was three weeks. *Spirochaeta pallida* was present on dark ground examination. He was treated with eight injections of 0.3 gram of salvarsan and seven weekly injections of 1 grain mercury cream. Treatment was completed on February 22nd, 1916.

Second Admission (August 12th, 1916).—The patient was admitted to hospital a second time with (1) a primary granulating syphilitic sore on the anterior aspect of skin of foreskin, (2) glands in groins enlarged and shot-like. The incubation period was four weeks. *Spirochaeta pallida* was present on dark-ground examination. The Wassermann reaction was negative both before and after treatment. Treatment was the same as on his first admission, and was completed on October 3rd, 1916.

CASE II.

First Admission (August 24th, 1915).—Signs of infection: (1) Primary papular syphilitic sore on inner surface of prepuce; (2) shotty glands in both groins. No other visible sign. Incubation period uncertain. *S. pallida* present on dark-ground examination. Treatment: Eight injections of 0.3 gram salvarsan and six weekly injections of 1 grain mercury cream. Treatment was completed on October 26th, 1915.

Second Admission (June 14th, 1916).—Signs of infection: (1) Typical papular erosive primary syphilitic sore on dorsal surface of prepuce; (2) shotty glands in both groins. No other visible sign. The incubation period was again uncertain. *S. pallida* present on dark-ground examination. Wassermann test negative. Treatment: Eight injections of 0.3 gram salvarsan with intervals, and five weekly injections of 1 grain mercury cream. Treatment completed August 26th, 1916.

CASE III.

First Admission (April 21st, 1915).—Signs of infection: (1) Large scar of primary, probably granulating, syphilitic sore on dorsum of body of penis; (2) condylomata on scrotum; (3) general adenitis. No other visible sign. Incubation period uncertain. Wassermann test positive. Treatment: Eight injections of 0.3 gram salvarsan and six weekly injections of 1 grain mercury cream. Treatment completed May 24th, 1915.

Second Admission (October 22nd, 1915).—Signs of infection: (1) Partly healed papular erosive primary syphilitic sore on outside of prepuce; (2) scar of former sore on body of penis; (3) adenitis in both groins. Incubation period uncertain. On October 26th Wassermann test negative, Stern incomplete; November 4th, Wassermann negative, Stern positive; December 15th, Wassermann positive, Stern positive. Treatment: Eight injections of 0.3 gram salvarsan and seven weekly injections of 1 grain mercury cream. Treatment completed February 5th, 1916.

CASE IV.

First Admission (October 1st, 1915).—Signs of infection: (1) Typical Hunterian chancre on inner surface of prepuce; (2) enlarged and shot-like glands in both groins. No other visible sign. Incubation period uncertain; patient first noticed sore five days before. *S. pallida* present on dark-ground examination. Treatment: Eight injections of 0.3 gram salvarsan and five weekly injections of 1 grain mercury cream. Treatment completed November 2, 1915.

Second Admission (March 28th, 1916).—Signs of infection: (1) Typical primary granulating syphilitic sore on outside of foreskin; (2) glands in groins hard and enlarged. No other visible sign. Incubation period four weeks. *S. pallida* present on dark-ground examination. Wassermann and Stern tests negative. Treatment: Eight injections of 0.3 gram salvarsan with intervals, and six weekly injections of 1 grain mercury cream. Treatment completed May 11, 1916.

CASE V.

First Admission (September 6th, 1915).—Signs of infection: (1) Sloughing primary papular syphilitic sore on end of prepuce; (2) glands in both groins hard and enlarged. No other visible sign. Incubation period five weeks; noticed sore seventeen days after exposure. *S. pallida* present on dark-ground examination. Treatment: Eight injections of 0.3 gram salvarsan and five weekly injections of 1 grain mercury cream. Treatment completed October 12, 1915.

Second Admission (March 24th, 1916).—Signs of infection: (1) Hard sore beneath prepuce—unable to completely retract foreskin; (2) glands in groin slightly enlarged. No other visible sign. Last exposure to infection two months before; noticed sore two weeks before admission. *S. pallida* present on dark-ground examination. Wassermann reaction negative. Treatment same as on first admission; complete May 9th, 1916.

CASE VI.

First Admission (December 1st, 1915).—Signs of infection: (1) Primary indurated papular erosive syphilitic sore at fraenum; (2) bubo in left groin and shotty adenitis in right groin. No other visible sign. Incubation period unreliable. *S. pallida* present on dark-ground examination. Treatment: Eight injections of 0.3 gram salvarsan and six weekly injections of 1 grain mercury cream; completed January 25th, 1916.

Second Admission (July 21st, 1916).—Signs of infection: (1) Typical Hunterian chancre on inner surface of prepuce extending into coronal sulcus; (2) shot-like glands in both groins. No other visible sign. Incubation period not reliable. *S. pallida* present on dark-ground examination. Wassermann test negative. Treatment: Eight injections of 0.3 gram salvarsan with intervals, and four weekly injections of 1 grain mercury cream; completed September 7th, 1916.

On the other hand there are cases of probably genuine reinfection that cannot fulfil the above conditions; for example, the conditions mentioned might be fulfilled with the exception that the patient was not seen in his second attack until the Wassermann reaction had become positive, or until secondary symptoms had appeared; such a case would then be open to the objection that it was really an instance of relapse, and not of reinfection.

In such a case the correctness of the diagnosis depends on the accuracy of the observation and the extent of the special experience of the practitioner, but anyone who has had considerable experience of syphilis must be fairly confident that he has seen genuine cases of reinfection, though the stringent conditions of "Series I" were not fulfilled.

In Series II will be found a record of such cases.

SERIES II.

CASE I.

First Admission (April 23rd, 1915).—Signs of infection: Small papular erosive syphilitic sore at fraenum. No other visible sign. Incubation period two weeks. *S. pallida* present on dark-ground examination. Treatment: Eight injections of 0.3 gram salvarsan and six weekly injections of 1 grain mercury cream. Treatment completed May 22nd, 1915.

Second Admission (August 29th, 1915).—Signs of infection: (1) Typical Hunterian chancre on inner surface of prepuce; (2) glands in groins a little enlarged. No other visible sign. Incubation period uncertain; sore noticed six days before admission. Wassermann test negative. Treatment: Eight injections of 0.3 gram salvarsan and five weekly injections of 1 grain mercury cream. Treatment completed October 12th, 1915.

CASE II.

First Admission (May 28th, 1915).—Signs of infection: Indurated papular ulcerative syphilitic sore in coronal sulcus. No other visible sign. Sore noticed six days before admission. *S. pallida* present on dark-ground examination. Treatment: Eight injections of 0.3 gram salvarsan and seven weekly injections of 1 grain mercury cream. Treatment completed June 29th, 1915.

Second Admission (September 10th, 1915).—Signs of infection: Non-inflammatory syphilitic oedema of prepuce with indurated lump to be felt beneath phimosed prepuce. Sore noticed for six weeks. *S. pallida* present on dark-ground examination. Treatment: Eight injections of 0.3 gram salvarsan and five weekly injections of 1 grain mercury cream. Treatment completed October 13th, 1915.

CASE III.

First Admission (June 9th, 1915).—Signs of infection: (1) Typical primary papular erosive syphilitic sore on inner surface of prepuce; (2) shotty glands in groins. No other visible sign. Incubation period two weeks. *S. pallida* present on dark-ground examination. Treatment: Eight injections of 0.3 gram salvarsan and six weekly injections of 1 grain mercury cream. Treatment completed July 20th, 1915.

Second Admission (July 22nd, 1916).—Signs of infection: (1) Primary granululating syphilitic sore on dorsum of body of penis; (2) glands in groin enlarged and shot-like. No other visible sign. Incubation period uncertain; sore noticed for five weeks. *S. pallida* present on dark-ground examination. Treatment: Eight injections of 0.3 gram salvarsan with intervals, and seven weekly injections of 1 grain mercury cream. Treatment completed September 7th, 1916.

CASE IV.

First Admission (September 9th, 1915).—Signs of infection: (1) Typical Hunterian cancer on inner surface of prepuce; (2) shotty glands in groins and neck. No other visible sign. Noticed sore eight days before admission. *S. pallida* present on dark-ground examination. Treatment: Eight injections of 0.3 gram salvarsan and five weekly injections of 1 grain mercury cream; completed October 12th, 1915.

Second Admission (February 7th, 1916).—Signs of infection: (1) Typical papular erosive syphilitic sore near fraenum; (2) adenitis in groins. No other visible sign. The sore is distinct from scar of original sore. Incubation period two weeks. *S. pallida* present on dark-ground examination. Treatment:

Eight injections of 0.3 gram salvarsan with intervals, and seven weekly injections of 1 grain mercury cream; completed March 20th, 1916.

CASE V.

First Admission (October 30th, 1915).—Signs of infection: (1) Primary papular erosive syphilitic sore on under surface of prepuce; (2) glands in groins hard and enlarged; (3) papular roseolar syphilide on body and limbs and also on face; (4) mucous patches on tonsils; (5) headaches. Incubation period uncertain; sore seen four weeks and rash ten days before admission. Treatment: Eight injections of 0.3 gram salvarsan and five weekly injections of 1 grain mercury cream; completed December 7th, 1915.

Second Admission (June 3rd, 1916).—Signs of infection: (1) Typical primary papular erosive chancre on lower lip just to left of middle line; (2) enlargement and hardness of sub-maxillary glands on left side. No other visible sign. Old scar of previous sore present under surface of prepuce. Most recent venereal exposure six weeks before admission. On dark-ground examination, *S. pallida* present from chancre on lip. Wassermann and Stern tests positive. Treatment: Eight injections of 0.3 gram salvarsan and five weekly injections of 1 grain mercury cream; completed July 24th, 1916.

CASE VI.

First Admission (September 3rd, 1915).—Signs of infection: (1) Typical papular erosive syphilitic sore on under surface of prepuce; (2) shotty glands in groins and neck. No other visible sign. Incubation period one month. Dark-ground examination. *S. pallida* present. Treatment: Eight injections of 0.3 gram salvarsan and five weekly injections of 1 grain mercury cream; completed October 5th, 1915.

Second Admission (March 9th, 1916).—Signs of infection: (1) Typical indurated sore at coronal margin; (2) bubo in right groin, glands in left groin. Scar on old sore on under surface of prepuce. Incubation period uncertain. Dark-ground examination, *S. pallida* present. Treatment: Eight injections of 0.3 gram salvarsan with intervals, and six weekly injections of mercury cream; Completed May 4th, 1916.

The cases in this series are not supported by the bacteriological findings and serum tests, and so do not comply with the conditions laid down for Series I, still the likelihood of the correctness of the diagnosis is enhanced by the fact that again, as in the cases given in Series I, the two distinct attacks of syphilis have been seen in all the cases here recorded by the same observer. The cases were seen, the notes checked, and the treatment of each patient carried out by me at the time of his first and second attack.

Twenty-eight cases of reinfection occurred in a series of 10,500 cases of syphilis treated in a general hospital during two years.—(*Brit. Med. Jour.*, Oct. 20, 1917.)

Vincent's Angina.

Deglos has reported his experiences with this disease in the military hospital at Grenoble. Out of 255 cases of sore throats of doubtful nature sent in for observation, in 21 the Vincent organisms were found to be present. The cases were mostly those of young soldiers with dirty mouths. The disease was most frequent in spring, disappeared in summer, and reappeared in the autumn. The early symptoms were slight in character; a little malaise, fatigue, some dysphagia, and, most noticeable of all, one or more tender glands in the neck. There was exudation, yellowish white, sometimes grey in color, spreading over the tonsil. It was easily detached, leaving an unhealthy-looking ulcer, and setting up a little bleeding. There was a very foul smell with it, and a great deal of salivation. There was a slight rise of temperature, and the pulse was a little quickened. The tendency of the disease is to recover, but some cases may be very obstinate and lapse into a chronic stage. The diagnosis must be confirmed by bacteriological examination, revealing the presence of fusiform bacilli and long spirilla.

The cases were treated by swabbing with a 10 per cent. solution of methylene blue, twice daily, after thoroughly cleaning away the exudation, and applying a solution of nitrate of silver to the ulcer. Deglos tried as well the application of neosalvarsan in powder or suspended in glycerine. In some cases he was able to report quick results from the intravenous injection of this substance, using Revaut's method of a concentrated solution. One injection of 0.30 g. in from 2 to 3 cc. of distilled water was followed by complete healing up in five or six days. A similar dose at the end of four days ensured complete recovery, clinically and microscopically. In eight or nine days.—(*Journ. de Méd. et de Chir. prat.*, February 25, 1918.)

Public Health

Laboratory Aid in Tracing Milk-Borne Typhoid Fever Infections.

L. M. Wachter of the New York State Department of Health says that if a study of the cases of typhoid fever suggests that milk is possibly the agent that transmitted the infection, its relation to the typhoid infection should be determined from the results of sanitary surveys of the places of production and distribution of the milk, and from the studies of the health histories of the individuals coming in contact with it. In the larger communities where milk is shipped from a distance, it is not always possible to determine accurately the source of all of the milk. When the sources are known, all of the places where the milk is regularly produced, or obtained occasionally because of shortage or other emergencies, should be investigated. The inspection should include the bottling plants and other places connected with the distribution of the milk.

The water used at an individual farm or at a bottling plant for washing or rinsing bottles, cans, and other milk utensils may at times transmit infectious material. The water supply should therefore be inspected, bearing in mind that to be a factor in transmitting typhoid infection, the water must first receive infectious material from a previous case. A well is the most frequent source of supply for a dairy farm or suburban bottling house. To justify a suspicion that a particular well water carries infectious material, it is necessary to determine a possible source from which this material could be derived, and a probable route by which the material reached the well water. Efforts should be made to locate the possible privy, sewer, or drain that carries human discharges and whose location would make it possible for material from it to reach the well water. If privy vaults are not properly enclosed and the top of the well is not properly protected by water-tight curb and cover, it is possible for chickens and other animals to soil their feet and then carry infective material to the well where it may be washed down into the well water. A great danger also exists that the ground water may carry infectious material into the well if the well penetrates rock, particularly if the rock reaches to, or near, the surface; for rock is usually fissured and these fissures frequently permit direct pollution of the well water.

Although empty milk containers should not be returned to the dealer from a home where there is typhoid fever, it is frequently done and this offers another opportunity for transmitting typhoid bacilli, unless the returned bottles are properly sterilized before being used again. Only pasteurization of the milk in the final container would protect the consumer from this danger.

Although the water used in washing or rinsing bottles and milk utensils, flies, and various other agencies, are occasionally the means of conveying *B. typhosus* to milk, in the majority of instances it is an individual closely associated with the production or distribution of the milk that must be sought. Therefore the typhoid carrier or convalescent handling milk presents the greatest danger and our search must not allow any one of this class to escape detection.

The classes of individuals who may transmit infections are the sick or convalescent whose disease was correctly diagnosed as typhoid fever, the mildly sick or convalescent whose illness was not recognized or was not diagnosed as typhoid fever, and the unrecognized chronic carrier who may be disseminating typhoid bacilli constantly or intermittently.

As the milkers come in most direct contact with the milk, the history of all milkers should be considered in a search for members of any of the above classes. The milking staff on many farms is constantly changing. It is also necessary, therefore, to obtain the facts concerning any persons who may have been employed a few weeks previous. Investigation frequently justifies the conclusion that a certain individual or individuals may possibly have played a role in transmitting the infectious agent to the milk.

In many instances the laboratory can be of valuable assistance by examining the intestinal discharges of suspected individuals. These examinations can be extended to a group of people, if the results of the investigation suggest that possibly there is a carrier among them. The laboratory frequently has been able to isolate *B. typhosus* from the discharges of suspects, to definitely determine their true condition, and thus to make it possible to prevent future dissemination of infection from these foci.

Within the last three years, in at least two investigations two typhoid carriers were found on a milk farm at the same time. In another instance a milk producer was found to be a carrier, after various milk-borne outbreaks had occurred in a city dur-

ing the fifteen years previous. In each instance suspicion had pointed towards this milk farm.

Since some individuals are only intermittently carriers, one negative result from a single specimen of feces does not justify a final conclusion. Several specimens should be sent to the laboratory at intervals if previous results are negative.

The laboratory examinations can also be used to determine when typhoid convalescents cease to have typhoid bacilli in their discharges. In these cases there should be several specimens sent to the laboratory, before finally deciding that the individual is no longer a carrier.—(*Health News*, Feb., 1918.)

Venereal Disease in Massachusetts.

Assistant Surgeon General Allan J. McLaughlin, U. S. P. H. S., outlines a statewide plan for the prevention of venereal diseases. He calls attention to the fact that a complex program is necessary if a successful campaign is to be waged against these diseases. Such a program will of necessity have two phases: one, a sanitary problem, to be handled directly by the health departments; and the other a moral, social and economic problem which to a great degree can best be handled by other agencies than the health departments.

Certain essentials of the program are indicated. Free diagnostic facilities such as Wassermann Laboratories should be established. Free treatment facilities should also be offered. In Massachusetts this is being accomplished through "state approved" venereal clinics situated at convenient places throughout the state. These clinics serve not only as centers for treatment but also for the distribution of free arsphenamine. Certain minimum requirements for these dispensaries are described such as equipment, personnel, records and laboratory service.

Emphasis is laid on the educational value of these dispensaries and on the need of general educational effort to impress upon the public the importance of the subject. This may be done through lectures, placards, etc. Repressive measures for the control of prostitutes are also necessary and here is needed the co-operation of the legal authorities.

Under the heading "measures which require legislation" may be grouped, according to the writer:

- (1) Reporting of venereal diseases;
- (2) Elimination of quacks;
- (3) Counter-prescribing in drug stores;
- (4) Examination and treatment of prisoners.

The method of reporting which seems most likely to succeed is based on the so-called West Australian system. Infective cases are reported by number but with the additional proviso that they are to be reported by name if the patients fail to continue treatment.—(*Public Health Reports*, Feb. 22, 1918.)

Child Care.

Things every mother must know if the Nation is to meet the health needs of its children as indicated by the draft and still further revealed by the weighing and measuring test are made available today by the Children's Bureau of the U. S. Department of Labor in its new bulletin on Child Care, prepared by Mrs. Max West.

A third of the men examined for military service in the first draft were found to have physical defects which rendered them unfit. Many of these defects might have been overcome if they had been recognized and dealt with in early childhood; the period between two and six is often the time when such defects make their first appearance. "Child Care" has been prepared in the hope that it would enable mothers to understand and recognize symptoms which indicate the need of special care, and also to give mothers the better understanding of the simple laws of hygiene through which it may be possible to prevent the development of such defects at all. It will be especially useful to thousands of mothers who have learned by the weighing and measuring test of defects and weaknesses in their children which need particular attention.

"Child Care" deals with children from two to six-years old and is the third issue in the series which began with "Prenatal Care," and "Infant Care." It contains simple rules of health and hygiene, including carefully compiled directions about proper food, suitable clothing, suggestions for play and exercise, for discipline and training. It gives simple menus for young children. A list of books on child care and training is added.

The fear of tuberculosis at the present time is unwarranted. To give the public the true facts regarding the disease would do much more to protect the future generations from the "Great White Plague."—Slater.

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Germany's Ethnic Pathology.

From the writings of such men as Henry Fairfield Osborn and Madison Grant our lecturers and pamphleteers are borrowing much ethnic material for the purpose of throwing light upon the fundamental reasons for our participation in the great war.

It seems that what ails the so-called German nation is the prevalence of round heads. The brachycephalic German owes his origin to the Alpine invasion.

Skulls with an index of 75 or less, that is, when the width is only a little more than three-fourths or less than the length, are considered dolichocephalic, or long skulls. Skulls of an index of 80 or over are round skulls, or brachycephalic (broad). The cephalic index is computed by multiplying the width by 100 and dividing by the length. The European populations are divided into three distinct subspecies, one northern and one southern, both dolichocephalic or characterized by a long skull, and a central subspecies which is brachycephalic, or characterized by a round skull.

Grant remarks that "While the inhabitants of Europe betray as a whole their mixed origin, nevertheless, the three main subspecies are each found in large numbers and in great purity."

The Nordic or Baltic subspecies is a long-skulled race, tall, fair-skinned, light-haired and blue-eyed. This group includes the Scandinavian and Teutonic peoples.

The Mediterranean or Iberian peoples are long-skulled and have dark eyes, hair and skin. This subspecies is short in stature in comparison with the tall Nordics.

The Alpines occupy all central and eastern Europe, extending through to Asia Minor. They are round-

skulled, sturdy and of medium height. Their hair and eyes were originally very dark.

The people of the British Isles are made up of a fusion of the long-headed Nordic and Mediterranean races. There are no round-headed Alpines. This fact, according to Grant, makes the desire of the Irish to separate themselves from their English brothers rather absurd on ethnic grounds, for the Irish belong to the Nordic group and are only a Celtic-speaking people. The true Celts were of Alpine stock.

The rank and file of the German army is largely composed of a pure or admixed Alpine type of soldier. The officers are everywhere recruited from the Nordic upper class. At least six-sevenths of the German people are not of Nordic or Teutonic stock.

In comparison with the other white races, the intellectual qualities of the Alpine race have always been mediocre. While the Nordic race has furnished a brilliant succession of military leaders, statesmen, explorers, organizers, aristocrats and inventors, throughout its entire history, the Alpine race has consisted always of peasants and has never been a seafaring people, which means that they have not developed one kind of bold initiative nor acquired that which intercourse with the peoples who dwell on the shores of the Seven Seas has made part of the Nordics' intelligence and equipment.

And so the argument runs that the overwhelming of the Nordic stock in Germany by the Alpine "invasion" has resulted in intellectual and moral deterioration, while there has been a military development along lines of unparalleled brutality. Thus the otherwise inexplicable barbarity of the German armies finds a plausible explanation.

A few hundred years ago the so-called Germanic peoples were preponderantly Teutonic, but the Alpine stock has steadily crowded northward, supplanting the Nordic stock as it underwent decimation in the course of inter-racial strife in pre-empire days and during the terrible slaughter of the Thirty Years' War. Today the majority of the Württembergers, Bavarians, Austrians and Tyrolese are merely Teutonized Alpines who have exerted but little influence upon European culture. The rank and file of the Prussians are nothing more nor less than Teutonized Wends and Poles of Alpine extraction. Their round, broad heads betray their origin.

The revolution of 1848, viewed ethnically, was really a revolt against the intellectual insolvency and moral bankruptcy of a government brutalized by the decadent influence of the race substitution that we have outlined. The revolutionists were liberty-loving Teutons of the old Nordic strain, representing the vigor, valor and manhood of chivalrous progenitors.

We are at war with hordes of round-headed Alpines led by Nordic stock which has rejected all the ideals and sentiments which have characterized intellectually the Teutonic peoples for centuries. Viewed in this light, the distinction between the German people and the German government seems worse than academic.

Hindenburg himself personifies dominant and brutal force, devoid of idealism and with little or no imagination, for he is of round-headed Alpine extraction.

"The truth of the matter is that the so-called Germanic race has been ethnically bankrupt for over one hundred years. The present military outbreak is but the evidence of this intellectual insolvency and moral bankruptcy, and the time has arrived for the whole world to sit as a solemn court of judgment and appoint a civilized receiver to either wind up or reorganize the national Germanic military establishment."

Sadly enough, this war between cousins is only another succession to the suicidal conflicts of the past, decimating still further the noble Nordic strain in the forces of the Allies.

What awful destiny is it that decrees what Grant calls the Passing of the Great Race?

A Statistical Shell Game.

Statisticians are engaged in interesting attempts to arrive at estimates regarding the influence of the war upon the birth and death rates. In the whole world there are supposed to be about 45,000,000 deaths annually. The population of the earth being about 1,700,000,000, the death rate is therefore about twenty-five per thousand. These are "before the war" figures.

Now if it be assumed that about seven or eight millions of soldiers have been killed during a war which has lasted several years, the addition that we should have to make to our estimate of 45,000,000 would be only two or three millions. This, say the statisticians, would not affect the death rate very greatly.

But to the soldiers who have been killed during the war we must add those among the civil population who have died as a result of disease and privation directly engendered by the war. The death rate among children is constantly rising in Europe, and even here grave fears are entertained for the younger generation, unless, as the war protracts itself, the special preventive measures now being organized prove effective.

It seems to us that the most practical way to look at the matter would be to figure only upon the populations of Europe and North America. There is a good deal of optimistic camouflage involved in the inclusion of the populations of Africa, South America and Asia, by which means it is made to appear that the war has had but little influence upon the world's population. We daresay it has not, from the point of view of ostrich-like statisticians. But we would remind the reader that the combined population of Europe and North America, the countries chiefly engaged in the war, is only about six hundred millions, as against about one billion, one hundred million in Asia, Africa and South America.

In connection with the rapidly decreasing birth rate in the belligerent countries consider the present environment and the future chances of the unfortunate arrivals, despite the noble efforts of the human salvage corps.

We do not believe that any good will come out of a disinclination to face facts that are really relevant and not concerned with the teeming populations of Africa and Asia. While we do not really know the total number of the slain, it is obvious that statistics of the sort we have described are designed to mitigate the awfulness of the holocaust that is going on. We do know that the white race is decimating itself, a process probably regarded with mixed feelings by hosts of men who are not white, and no tinted statistics can disguise the drab and sombre fact.

Significant Social Reactions of Feeble-Minded Groups.

In pointing out the great menace of feeble-mindedness in an address recently before the National Conference of Social Workers at Kansas City, George Hastings stated that there were about 400,000 feeble-minded persons in this country. About 12,000 men have been rejected from the National Army on account of nervous and mental disorders, of whom about 4,000 were re-

jected because of feeble-mindedness. Hastings advocates a census of the feeble-minded, so that we would know the number and whereabouts of these serious obstacles to progress.

Group feeble-mindedness probably plays a part in our disgraceful lynchings. The mob spirit is an emotional reaction most readily set up in the minds of a mentally inferior group. We say that the mob spirit is infectious, and so it is, in a ratio exactly proportionate to the intelligence of the crowd concerned. Lynchings are a rough and ready test of the mentality of a community, where.

It also appears probable that among the factors making it possible for the Central Powers to keep their peoples in subjection is an element of feeble-mindedness. The masses of the people in these countries are known not to be intelligent, and to have their destiny determined to the minutest degree by the ruling classes, who are highly intelligent. While this is true in varying degree of all countries, it is especially the case in the Central Powers.

We have no hesitation in declaring our conviction that if a census is ever made according to the proposal of Hastings it will be found that the incidence of feeble-mindedness is more marked in the lynching communities than elsewhere.

The Relation of Domestic to Social Pathology.

Sexual selection is undoubtedly an important factor in the perpetuation of feeble-mindedness. Many men marry by preference the kind of female whose mentality in no way challenges the domestic supremacy of the precious male. A husband's overlordship is easily established and maintained over a defective wife, and domestic contentment too often spells nothing but pathology.

A vast number of men are saturated with the age-long standards of the race regarding the relations of the sexes. They think and act the way they do because they cannot help it. One notes that even where men are decently bred, well educated, socially experienced, and even cultured, there are frequent instances of instinctive attitudes toward women which connote very strong influences of the sinister sort that we have suggested.

An intellectual thoroughbred can hardly be imagined choosing deliberately a substandard human being for a wife, yet it is astonishing how frequently we find men of rather uncommon parts mated with obviously inferior women.

The writer recently saw a group picture of the wives of a number of noted men associated together in high political office. It was a pathetic human document from the point of view of this editorial. Even from this photograph one could not help deducing much regarding the old time masculine psychology.

The feeble-minded wife is complaisant, obedient, meek, content and not preoccupied with advanced ideas. If she be good looking besides, and not actually uncouth in any way, she meets ideally the requirements of many men, even forceful men of affairs.

This phase of sexual selection is real; it exists in actual operation on a vast scale; it is an important if not the chief factor in the perpetuation of feeble-mindedness, for the progeny of such mating is in part doomed in accordance with the Mendelian law.

We joke a good deal about the domestic situations that result from these alliances, but our humor does not camouflage very effectually their sickening side.

Miscellany

CONDUCTED BY ARTHUR C. JACOBSON, M. D.

Historic Parallels.

Von Humboldt, in his "Personal Narrative of Travels," notes that in Egypt, in the thirteenth century, the habit of eating human flesh pervaded all classes of society; extraordinary snares were spread for physicians in particular. They were called to attend persons who pretended to be sick, but who were only hungry; and it was not in order to be consulted, but devoured. An historian of great veracity, Abdallatif, has related how a practice, which at first inspired dread and horror, soon occasioned not the slightest surprise.

Nowadays it is health insurance which we are invited to walk into. Its proponents wish to eat us alive and therefore are cannibals.

Same old game in modern guise.

The Way Out of War.

Robert T. Morris says that man when engaged in warfare is killing his own species. Predatory animals, he continues, prey upon other species and not upon their own kind. Man therefore, he concludes, appears to be acting abnormally in relation to nature's rule. He assumes that man's mind works abnormally in order to correspond to a body working abnormally, because man's anatomy is not adapted to the erect posture. He apparently went all wrong when arising upon his hind legs. Structure and function are closely allied.

We suggest that after the war the League to Enforce Peace might devote itself to a propaganda aiming to induce men to resume all fours.

We have all been somewhat at a loss to construct a working basis for perpetual peace, but an effective plan now looms up.

Pacifists take notice.

Samuel Butler on the Absurdities by Which We Maintain Our Sanity.

All our lives long, every day and every hour, we are engaged in the process of accommodating our changed and unchanged selves to changed and unchanged surroundings; living, in fact, in nothing else than this process of accommodation; when we fail in it a little we are stupid, when we fail flagrantly we are mad, when we suspend it temporarily we sleep, when we give up the attempt altogether we die. In quiet, uneventful lives the changes internal and external are so small that there is little or no strain in the process of fusion and accommodation; in other lives there is great strain, but there is also great fusing and accommodating power. A life will be successful or not according as the power of accommodation is equal to or unequal to the strain of fusing and adjusting internal and external changes.

The trouble is that in the end we shall be driven to admit the unity of the universe so completely as to be compelled to deny that there is either an external or an internal, but must see everything both as external and internal at one and the same time, subject and object—external and internal—being unified as much as everything else. This will knock our whole system over, but then every system has got to be knocked over by something.

Much the best way out of this difficulty is to go in for separation between internal and external—subject

and object—when we find this convenient, and unity between the same when we find unity convenient. This is illogical, but extremes are alone logical, and they are always absurd, the mean is alone practicable and it is always illogical. It is faith and not logic which is the supreme arbiter. They say all roads lead to Rome, and all philosophies that I have ever seen lead ultimately either to some gross absurdity, or else to the conclusion already more than once insisted on in these pages, that the just shall live by faith, that is to say that sensible people will get through life by rule of thumb as they may interpret it most conveniently without asking too many questions for conscience sake. Take any fact, and reason upon it to the bitter end, and it will ere long lead to this as the only refuge from some palpable folly.

War Activities

Triumphal Trip of Distinguished Foreign Medical Men.

Dr. Franklin Martin, Member of the Advisory Commission of the Council of National Defense and Chairman of the Council's General Medical Board, authorizes the following:

After a tour of many American cities, which enabled them to meet and address representative groups of American physicians and surgeons, Sir James Mackenzie, noted heart specialist of Edinburgh and London; Colonel Sir William Arbuthnot Lane, veteran surgeon of the Zulu, Egyptian and Boer wars, and authority on bone surgery, and Colonel Herbert Alexander Bruce, of Toronto, now consulting surgeon to the British armies in France, comprising the medical mission sent by the British Government to this country have returned to Great Britain.

"In the travels of our mission through America, we have been to many centers of war activity here," said Colonel Bruce, "and we will have a great deal to say when we get home about the marvelous and effective program which you are carrying out on so colossal a scale. I want to say that it has heartened us very much, and that we know it will hearten the people at home when we report there."

The visitors first came to Washington to pay their respects to Surgeon General Gorgas. Thence they departed for Cincinnati to attend the annual meeting of the American Surgical Association. At a special patriotic session in the Hughes High School, Cincinnati, June 6, under the auspices of the Ohio State Committee, Medical Section, Council of National Defense, Colonel Bruce described the British system of caring for the wounded. He stated that the British have forty hospital trains in France fully equipped with doctors and nurses, each train having a capacity of 600 beds—the whole constituting a mobile hospital of 24,000 bed capacity. He paid tribute to the heroism of the field hospital service and to the American surgeons and physicians in that service.

Sir Arbuthnot Lane told of the treatment of thousands of soldiers wounded in the face, some with jaws gone, others with cheeks or noses shot away. Colonel Lane is consulting surgeon at the Queen's Hospital at Sidcup, where this facial reconstruction or plastic surgery is the special work. "The man who loses an arm, a leg, or is injured in the body, can go back to the bosom of his family, but the man whose face is distorted, no matter how much his family may love and cherish him, suffers most," said Sir Arbuthnot. "So I began to isolate these cases, beginning with five doctors. This start has developed into a magnificent hospital with 750 men, and we are literally making new faces. We have enlisted the services of the best dentists, sculptors, wax workers, and surgeons, and developed specialists in transferring bones from other parts of the body to the face. If you could see how happy these men are, it would be a lasting satisfaction to know their gratitude."

Sir James Mackenzie told of some of the heart cases referred to him. "Instances of 'irritable heart,'" he said, "are due to general weakening of the body through illness in the trenches." Outdoor exercise and sports are curative agencies, he said.

Sir James, in speaking of the examination of recruits, said: "The tests of a man's fitness as a soldier should depend upon what he has been doing and what he is able to do. A young fellow was sent to me because his heart was supposed to be bad. I asked him what he had been before he entered the service. He said he had been a butcher. I asked him if he had

been able to carry the carcass of a sheep upstairs and whether such work had been a regular part of his duties. He said that he had been accustomed to doing exactly that, and frequently, and without physical discomfort. I said: 'I do not need to examine your heart. If you can do work like that you are certainly fit.' Too many men are rejected because of alleged defects which are more apparent than real."

It was after this meeting that Colonel Lane asked why women are not eligible to the Medical Reserve Corps. He said that he had been instrumental in having them admitted to the medical service in Great Britain.

The noted British surgeons were guests at the monthly meeting of the General Medical Board of the Council of National Defense and at the meeting of the State and County Committees of the Medical Section of the Council, held Sunday, June 9, in Chicago. At this time Colonel Bruce took special pains to speak of the work of American surgeons, many of whom are members of the General Medical Board who are doing most important work at the front—Drs. Frederic A. Besley, George W. Crile, J. M. T. Finney, Charles H. Peck, William S. Thayer, Harvey Cushing, George E. Brewer, Richard H. H. Harte and others. "These men went over as medical men—and stayed as soldiers, for they operate at the front lines amid bursting shells and are continually under fire. While I was in France before leaving to come here on this mission, Sir Arthur Sloggett of the British Medical Service sent for me and said he wished me to take a message to America. This is what he said: 'I appreciate the very excellent work which American doctors and American nurses are doing in the British service.' He said they had been a very great help and an inspiration to the service. In fact, they will never forget the American doctors and nurses. He recommended a large number of your medical officers at the front for the same honors that he had recommended for those in his own service, but owing to the regulation of your Government they were not able to accept."

"On a recent trip to the front, I met also a number of your soldiers, who gave me the opinion when one looked in their faces that nothing would stop them, and you know what they did when they first encountered the Hun quite recently. I don't think you need to worry about the enemy getting a few feet of territory. One or the other side can get some ground if they pay a sufficient price for it, and during the offensive of the 21st of March, and subsequent dates, the Hun paid a very large price for the territory which he took. Even if we should be driven to the sea, and if we have to take to the boats and go to England, this battle is not over. 'We will make it so that ships sailing through the Irish sea sail a sea boiling with submarines,' said one of the German leaders in February, 1917. To which England replied: 'Make it boil like the caldrons of hell, and we will sail just the same.' We of Canada and you of the United States are of the same race and blood. Now that we are comrades in arms, we have a still further bond uniting us. I have difficulty in appreciating the difference between Canada and America. I can tell you the difference between England and America. England says: 'As it was in the beginning, is now, and ever shall be. Amen.' America says: 'As it was in the beginning, is now, and by gosh there's got to be a change.' That spirit now represents the opinion of England as well as that of our allied nations."

"The German chancellor when America entered this war very sneeringly remarked that the weight you would throw into the scale would not be greater than that of a straw. To this Mr. Punch replied that he quite agreed with the statement of the German chancellor, but he would like to point out and make the prediction that it would be the last straw which would break the camel's back."

Sir James Mackenzie praised highly the classification of American surgeons as reported by Dr. William J. Mayo for the Committee on Surgery of the General Medical Board. The class indexing and coding of the more than 20,000 American physicians was termed ideal by Sir James, who said that the United States is avoiding the mistakes made by England. "England," he said, "was precluded from such a systematic course by the suddenness with which the war came."

Colonel Lane told of the enormous help given by American surgeons who came over long before America's entry into the war, saying that he had been asked to speak about the difficulty of getting medical men for the military service. He said: "The difficulty with us has been to keep them out. I do not suppose you are any different from our men. I have always understood that the medical people in America were the keenest people in the world. Our people have gone without a word. They gave up their practices, their futures, their wives and their children. They did not ask: 'How much are we going to be paid?' or 'What is going to become of our families?' they came at once to the aid of their country. I do not think you will have to

ask the medical men to come. I think the difficulty, my friends, will be keeping them away."

After their attendance upon the sessions of the American Medical Association convention, the visitors made a trip to Rochester, Minnesota, as guests of the Mayo brothers. In Boston, on June 19, the visitors spoke at sessions of the Massachusetts Medical Society in the Boston Medical Library. After this, came visits to Detroit, Cleveland, Pittsburgh, Philadelphia, and New York City, accompanied by Dr. Franklin Martin, Member of the Advisory Commission of the Council of National Defense and Chairman of the General Medical Board, and Major Henry D. Jump of the General Medical Board, arrangements being made in advance for them to speak at meetings held under the joint auspices of the State Committees, Medical Section, Council of National Defense and the local medical societies. Upon all these occasions the visitors urged the need of physicians at the front, and warmly seconded the efforts of the State Committees, and of Dr. Martin and Major Jump, in appealing to the doctors to enroll in the Medical Reserve Corps, Naval Reserve Force and Volunteer Medical Service Corps.

In Detroit on June 21, the visitors were shown about the city and visited the Packard and Ford plants. In the evening at a big meeting in the new Elks Temple Auditorium, Colonel Bruce spoke of the work of Detroit surgeons at the front, including Drs. Angus McLean, Burt R. Shurly, Theodore A. McGraw, Harry N. Torrey, William A. Spitzley, Frank B. Walker, Louis J. Hirschman, Ernest K. Cullen, and also Dr. John R. Sherrick, a Michigan physician who has been awarded the military cross for gallantry.

Colonel Bruce frankly criticised Americans for eating too freely, saying that the menu cards in hotels and restaurants astonish foreigners. He urged that white flour and meat be conserved to a greater extent, and that the use of motor cars for pleasure be cut down.

Colonel Lane urged that instead of being lulled into security by the apparent success of war-winning work, America should forge ahead to greater efforts.

From Detroit the party went to Cleveland by boat. After a dinner at the Union Club, there was a largely attended meeting at the Chamber of Commerce, over which Dr. C. A. Hamann presided. In addition to the talks by the visitors, Dr. William E. Lower of Cleveland, who recently returned after a year's service with the Lakeside Unit at the front, also spoke.

Thence to Pittsburgh, where Dr. J. J. Buchanan, Chairman of the State Committee, Medical Section, Council of National Defense, and his coadjutors, had made such preparations for the meeting that two thousand persons thronged Carnegie Music Hall for the meeting Sunday night, June 23.

"When I left England I felt certain that we should win the war sometime," said Colonel Lane. "Since I have been in this country I have become more certain, and I have come to believe that we shall win it soon." Colonel Lane spoke with enthusiasm of the shipbuilding activities he had seen on this side. He regarded as equally efficient the medical organization work in Washington under Surgeon General Gorgas and Dr. Franklin Martin. "You can make a soldier in four months for the sea, earth, or air," he said, "but it takes seven years to make a doctor, and after we get him he must learn his job. It makes a vast difference in the work of a hospital whether or not it is organized for efficiency, and this depends largely upon the fitness of the physicians for their particular work."

Colonel Bruce said that the work of the medical men in the armies had stamped out typhus and typhoid fever, there being when he left France only twenty-seven cases of typhoid fever in an army of two million men. He told of an experience he had had in a hospital bombed by the Germans adding that sixteen wounded German prisoners had been killed by one of the bombs dropped.

In Philadelphia the visitors were the guests not only of the physicians, but of the city as well. Forty prominent men, including city officials and leaders in various activities, attended the dinner in their honor at the Bellevue-Stratford Monday night, June 24. During the day the visitors had been taken to Cramp's Shipyards, the plant of the International Shipbuilding Corporation at Hog Island, and the Eddystone plant of the Remington Arms Company. The meeting at 9 o'clock in the Bellevue-Stratford ballroom was presided over by Dr. Edward Martin of Philadelphia. Colonel Lane said: "When America sent Dr. Alexis Carrel to Europe, she did more than if she had sent ammunition, guns and food. His discovery has worked miracles among the wounded of the Allies." Colonel Lane also praised highly the other doctors and nurses from the United States.

Sir James Mackenzie asserted that England is not in danger of starvation. "Nor are there any signs of famine at present," he said. "Up to the last harvest, food was scarce, and we had

a hard time to get the staples of life, especially cheese and potatoes. Now things are running smoothly." Sir James urged that efforts be made to counteract German propaganda in Russia.

Colonel Bruce asserted that the imaginary boundary line between Canada and the United States had been wiped out, and that the present war has cemented the relations between the countries. Speaking of England's independence of Germany, he said: "We make our own dyes, and we do not bother or even give a thought about the supply of German potash. Five thousand ships enter and leave British ports each week. We have loaned 600 ships to France and 400 to Italy. Before the war less than 200,000 women were engaged in work; now the number exceeds one million, in more than 400 branches of munitions manufacture. Social distinctions have been leveled in the utter democracy of overalls and caps."

On the eve of their departure the distinguished visitors were entertained at a dinner given them by the New York doctors at the Metropolitan Club.

Army Hospital Construction.

Construction of additions and improvements to the hospital establishment of the Army in this country during the past six months has been undertaken by the Construction Division of the Army at an estimated cost of \$25,173,417.55. The new buildings consist of hospitals, convalescent barracks, infirmaries and nurse's quarters. The figures given represent work finished and in the course of completion, both within and outside the camps and cantonments.

The following additions have been made at National Army and National Guard camps, producing an increase in bed capacity: To both of the hospitals at Camp Gordon and Camp Dodge, a 50-bed addition has been made including officers' and nurses' quarters, at a total cost of \$550,000. Additional two-story ward convalescent barracks are being provided at National Army and National Guard base hospitals, adding from 300 to 900 beds to each hospital. The total estimated cost of this construction is \$9,179,000. Umbrella sheds to connect these barracks are being constructed. At each National Army cantonment two regimental infirmaries have been erected, while one regimental infirmary has been constructed at each National Guard camp and remount depot. The total cost of these is estimated at \$344,000. At National Guard camps and National Army cantonments, dental infirmary operating buildings have been erected at an estimated cost of \$912,000. A dental infirmary and an eye, ear, nose and throat clinic have been erected at each National Guard camp at a total cost of \$139,200. The installation of steam cooking equipment in the general kitchens of hospitals has been made necessary by the increase in bed accommodations in all National Army cantonments and National Guard camps. An additional 1,500-bed hospital is now nearing completion at Camp Merritt. This hospital is being erected at an estimated cost of \$1,115,000. Work to cost about \$220,000 is now being done at Camp Stuart to provide a venereal tent hospital and additional hospital buildings. The engineers' training camp at Belvoir, Va., will soon have finished a 500-bed hospital which will cost \$1,125,000.

The following construction is in progress at the U. S. Army general hospitals: At Walter Reed General Hospital, Washington, D. C., additional hospital buildings in tile are being erected at an estimated cost of \$733,400. At Denver, Col., a 1,000-bed tuberculosis hospital is being erected of hollow tile and stucco construction, the estimated cost of which is \$1,720,000. At Azalea, N. C., a 1,000-bed hospital for the treatment of tuberculosis patients, is being erected at an approximate cost of \$1,325,000. A 120-bed hospital is under construction at the Norfolk Quartermaster Terminal, Norfolk, Va., at an approximate cost of \$205,900. A 1,500-bed hospital has been erected at the U. S. General Hospital No. 3, Colonia, N. J., at an estimated cost of \$1,632,000. At U. S. General Hospital No. 6, located at Fort McPherson, Ga., additional two-story nurses' quarters are being erected at an approximate cost of \$88,700.

The construction of a hospital for the care and education of blind soldiers known as the U. S. General Hospital No. 7, is being erected at Roland Park, Md., at an estimated cost of \$240,446. A tuberculosis hospital capable of caring for 650 patients is being constructed at General Hospital No. 8 at Otisville, N. Y., at an estimated cost of \$957,000. The Lakewood Hotel and "Florence in the Pines" at Lakewood, N. J., have been leased for hospital purposes at an annual rental of \$58,500. A hospital that will care for 1,762 patients is nearing completion at Fox Hills, N. Y., which will cost \$2,085,000. At General Hospital No. 14, located at Fort Oglethorpe, Ga., two-story convalescent barracks are being erected, giving an added bed accommodation of about 1,000 at an approximate cost of \$202,200.

In view of the increased hospital facilities at the various camps, the following accommodations have been constructed: Nurses' quarters and additions to officers' quarters have been constructed at National Guard camps and National Army cantonments at a cost approximating \$1,000,000. Wards and isolation wards for the treatment of female nurses are being erected at all National Army cantonments and National Guard camps and at Camps Merritt, Stuart, Humphreys, Johnston and General Hospitals No. 2 at Fort McHenry, Md., No. 6 at Fort McPherson, No. 8 at Otisville, N. Y., and No. 10 at Fox Hills, N. Y., at an estimated cost of \$181,350. Sanitary accommodations for female nurses have been installed in the wards at the hospitals at National Army cantonments. For the general welfare of the patients at the various hospitals, automatic fire alarm systems have been installed in the hospitals of the National Army and National Guard camps, and at Camp Merritt, Stuart, Funston, Walter Reed General Hospital and General Hospital No. 1 at New York at an estimated cost of \$1,200,000. For the same purpose screening is being installed in all hospitals, including closed corridors and porches. Steam disinfectors are being installed at National Army and National Guard camps as well as Camps Johnston, Stuart, Merritt and at General Hospital No. 3, Colonia, N. J., at a total cost of \$69,721.

Tuberculosis in France.

France is finding in tuberculosis one of the worst of war's by-products. Before the conflict had continued two years her hospitals were filled with soldiers suffering from the plague and facilities for adequate care of them were lacking. The following facts as to measures invoked are extracted from a recent report by Dr. William Charles White, Chief of the Bureau of Tuberculosis, of the American Red Cross in France:

When the American Red Cross, in co-operation with the Rockefeller foundation, entered the fight against tuberculosis in France, the Service de Sante of the army was utilizing all the main French institutions, and there was little room available for the women, children and old men suffering from the disease. Last October there were 8,879 tuberculous French soldiers, not yet discharged from service, and for these 6,521 beds had been provided in thirty-seven hospitals. Between August, 1914, and November, 1917, there were 80,551 soldiers discharged from the army on account of tuberculosis and the French department of the Interior undertook to provide for their care by means of stations sanitaires and departmental committees.

Until recently practically no provision had been made for the repatriates—that portion of the population which had been engulfed by the German advance into France and Belgium, and, being no longer of any economic use to Germany, the aged, the young, and the diseased had been sent back into France. A large proportion of these are consumptive. The wretched housing conditions in which many refugees were compelled to live in Paris and elsewhere made them peculiarly subject to tuberculosis.

A careful survey of the field indicated that the Red Cross could render most effective assistance among these groups. The first opportunity for usefulness came in the survey of conditions in the Tuberculosis barracks which had been provided by the Assistance Publique in connection with the large hospitals and almshouses in Paris. There were 1,052 beds in them, yet only 174 were occupied. Unattractive conditions seemed to explain, in large part, the failure of the sick to make full use of this institution. The American Red Cross thereupon increased the nursing force, established diet kitchens and recreation rooms, and provided additional clothing and materials, such as bed covers and flowers. The institution quickly became more popular and soon was caring for 657 patients. Later, new cure halls, dining rooms, and recreation rooms, were constructed by the Red Cross.

A survey of the institutions outside of Paris showed that these provided 11,000 beds for a population of 39,500,000 persons, with a total death rate from tuberculosis in 1913 of 84.443. Many of these institutions required additional bedding, food and equipment, which the American Red Cross undertook to furnish at a cost to it of approximately 100,000 francs a month.

Another plan similar to the Home Hospital plan in New York City now is being used in France, especially for those refugees and repatriates families with tuberculosis members. These, if allowed to go into ordinary houses well might spread infection. The new plan contemplates placing such families in small houses especially constructed for the care of a tuberculous member. Each house is composed of three rooms—two sleeping rooms and a living room—with a small porch for the patient. The children will be placed in open-air schools, and those able to work will be given vocational training in such

trades as gardening, carpentry, tailoring and shoemaking. The domiciliary care of the consumptive, it is believed, is one of the most important factors in the war against tuberculosis in France, as elsewhere.

After studying the question of the relation of tuberculosis to the various armies, it was decided that the American army, no matter how careful the exclusion of tuberculosis cases in the draft, would still have to deal with a group of cases which would develop tuberculosis from existing lesions not possible of diagnosis in earlier examinations. It was thought that this was a field of work in which the American Red Cross could give assistance to our own army in France. It seemed obvious that there would appear certain pneumonic types of tuberculosis, certain acute military cases, severe hemorrhagic and pleuritic cases, and probably a number of cases of tuberculosis in parts of the body other than the lungs.

An offer to the Army Headquarters to provide a hospital near the shipping ports where the Red Cross would be given permission to take care of such cases needing attention prior to their return home, has been accepted. The American Red Cross will undertake the provision of one such hospital which then will be turned over to the army. A similar institution may be provided at a second point.

Four tuberculosis hospitals in France are now maintained and conducted solely by the American Red Cross and ninety-six French hospitals are aided with funds and supplies and in addition much educational and visitational work is being done.

They Were Selling Bones for Food in England.

Over in England at the height of the meat shortage and before the populace was put on rations, they sold bones at the rate of five pounds for one shilling. Policemen regulated long lines of people patiently standing out on the sidewalks, waiting, not for their favorite matinee idol to pass, but for a chance to enter a food shop and buy a small quantity of food. It takes about three minutes for the shopkeepers to dress their windows over there, merely because there are, perhaps, but a few cans of condensed milk and a box or two of corned beef to be displayed.

Yet over here in America, bones, hay, even fats and precious scraps of meat are going into the garbage pails! Although in many cities there were long lines of people waiting last winter for supplies of coal, there has as yet been no pinched-faced mob pleading for food. True, there are frequently long lines of people on the street, but mostly they are buying tickets to shows! In the busy streets in towns and cities, shopkeepers display elaborate arrangements of all kinds of delicacies in their show case windows. They would scorn a "display" of corned beef and condensed milk!

The accompanying pictures are from the Official Press Bureau in London. They were sent over to this country for the express purpose of showing America what England was actually facing. A country in such straits not only needs help herself, but cannot possibly be expected to contribute to the support of United States troops now on the other side. The food shortage is real. Save food and "Carry On."

The Physician's Library

The Exceptional Child. By Maximilian P. E. Groszmann, Ph.D. Charles Scribner's Sons. 764 pages. 63 illustrations.

Groszmann gives a perspective of the entire situation as regards the exceptional child, and suggests wise ways and means of getting the most out of him, for his own sake as well as that of the community. The book is opportune, enormously helpful, and distinguished in insight and spirit. The author has taken long steps forward in his field, and has a happy gift of investing his subject with an almost romantic interest. Dr. Groszmann might object to the use of such a word as romantic in the characterization of his work, but who can deny that there is a nimbus about the child genius. Here is mysticism indeed, for no one may know which exceptional child is a messiah, hence an elusive sacredness pertains to all peculiar children.

"As in the conversion of crude oil into petroleum it was found that the by-products (naphtha, aniline dyes, mineral oils, medicines, etc.) out-value the first product, so by an analogous process we are beginning to find that the by-products of the raw human material, represented by the many individual variations, are far more valuable than the 'average' person." While taking care of the average children we should not permit the 18 per cent. of atypical ones to increase the refuse-heap of human derelicts. Yet this is exactly what we are doing now, and it is costing us \$3,500,000,000 annually to support our institutions—half again as much as goes for training in schools

and colleges. It is entirely possible to institute constructive conversion and conservation and make assets out of the material that now goes wrong, and Dr. Groszmann tells us how.

The exceptionally fit provide our leaders and builders, our banner-bearers and thought-heroes, our saviors and our martyrs—as well as our destroyers, cranks, perverts, and felons, the Mephistopheles and the Tartuffes, for these individuals of one-sided development may easily slip from one class to another at any given moment of tension; hence the necessity of wise management, lest the exceptionally fit become the exceptionally unfit.

In his discussion of genius Dr. Groszmann seems to us to reveal uncommon understanding. The prevailing, bourgeois opinion postulates the essential insanity of genius, a doctrine of the crowd lacking any defensible basis. The vulgar view is that the true genius is necessarily crazy, and our intellectual plebeians in academic, medical and literary circles foster it assiduously. Groszmann points out that the persons who manifest genius are of unstable equilibrium and possess psychic defects that always endanger their sanity, which is a very different thing from identifying the two things. Close analysis of apparently normal geniuses of the past and present would, he thinks, reveal the weak spot, or danger zone. Only in this sense is there any relationship between genius and insanity. Genius makes for insanity, but insanity never makes for genius. Insanity is the Nemesis of the delicately balanced genius, never his good angel. To the degree that clinical insanity enters in, to that degree is his work vitiated. He does his work not because of, but in spite of, the Damoclean sword. The genius at the time of his best creative work must be eminently sane—supersane. No great work can possibly be produced if this endowment be lacking, yet for all that the genius possesses a curious capacity for insanity as well as for superlative sanity. As a watch is not built to withstand lawn-mower usage, so the delicate organization of the genius is apt to be injured by the hard conditions of our social system. If the vulgar theory were correct the greatest things should issue from the asylums of the land; they would be the ganglia and power stations to which the world would look for the masterpieces that thrill the soul and justify the hope that we are not, after all, only gloriously evolved beasts.

Groszmann points out the fallacies of the Binet-Simon tests and presents a scheme of his own that takes many other things besides intelligence into account. We all know that it is not fair to compare an imbecile of a certain mental age with a normal child of that age; they are not at all alike.

The benevolent despotism of socialism toward which the after-the-war world will rapidly move will inaugurate a paradise for the specialists now so handicapped in their work of child salvage. Nevertheless, we fear that it will inaugurate a hell for children of genius, for the new order will be a tyranny aiming at materialistic ends, adaptation of all units to the state machinery, and industrial Kultur, a program which, of course, will utilize much of the special knowledge now in process of acquirement, but will take no account of the things of the spirit.

The author wisely leaves the medical aspects of his subject to a group of twenty-five physicians, skilled in dealing with exceptional children. Their contributions constitute 145 pages of the appendices.

A. C. JACOBSON.

Big Gain of Labor Output by Health and Safety Measures.

The Employment Managers' Conference at Philadelphia suggested that as much as 60 per cent. in output of labor per man could be gained by a rational system of management which would give due regard to the worker's health and safety. The measures advocated had to do with shortening the working day, providing rest periods, advancing piece and time rates, cutting all overtime, re-creating in the employee an interest in the job he is doing and helping him to get the most out of his earnings and his leisure. Among practical plans for reducing labor turnover were mentioned proper selection of employees, adequate wages, steady work, promotion of physical efficiency and good habits, hearing of complaints, provision for pensions, profit sharing, etc. "Bad systems or no systems of handling employees" was put down as the greatest waste in all industries. —(Monthly Review, U. S. B. of L. S., Feb., 1918.)

Patients suffering from tuberculosis should be encouraged to have an early diagnosis of the disease made and be given every aid in the fight to regain their health. On account of the attitude of fear often held regarding one suffering from tuberculosis, they hide the fact that they have the disease, thus losing a chance to recover, and because of failure to take precaution often spread infection.—Slater.

Diagnosis and Treatment

Polynuritis and Hyperesthesia.

J. C. Regan of New York says there is a polynuritis form of Heine-Medin's disease which resembles very closely an acute multiple neuritis. When poliomyelitis is epidemic, any case of acute multiple neuritis in a child should be regarded with suspicion, especially so if it is of unexplained origin and is accompanied by a febrile onset. In the differential diagnosis it is important to remember that multiple neuritis occurs rarely in childhood, and then only after the acute specific fevers, especially diphtheria. The history of onset, the clinical symptoms (as outlined in the preceding text), and the findings upon analysis of the cerebro-spinal fluid, together with the progress and ultimate termination of the paralysis will afford sufficient data to distinguish the polynuritic form of poliomyelitis from post diphtheritic paralysis. A moderate or marked lymphocytic increase in the spinal fluid, over 40 cells per cu. mm. would be a strong point in favor of poliomyelitis, while a normal fluid would be more apt to indicate post-diphtheritic paralysis.

At times cases of sporadic poliomyelitis are encountered without neuritic symptoms, but which by reason of the localization of the paralysis and the previous history of sore throat, render their resemblance to diphtheritic polynuritis very close (case 2).

The so-called "acute infective neuritis" is undoubtedly frequently due to the causative agent of poliomyelitis, and, in the past, there can be little doubt that numerous cases of Heine-Medin's disease escaped recognition under this misnomer. In the future an examination of the spinal fluid will be necessary before a case can be classified under this title.

As a symptom, polynuritis is extremely frequent in poliomyelitis, probably occurring in more than one-half of the cases. It is of variable intensity and is often very marked. It usually appears in the early paralytic stage when the initial hyperesthesia begins to subside; it may persist for a week or two or may last in exceptional instances for months. The lower extremities are most commonly involved, the upper extremities being only occasionally affected. The presence of polynuritis is best determined by pressure over the involved nerve trunks, especially the sciatic, and by passive motion. The degree of pressure necessary to elicit tenderness varies with the severity of the neuritic process. Certain passive movements are very painful, notably those concerned in eliciting an ankle clonus and Kernig's sign. A false reaction may be obtained in the latter instance due to the voluntary effort the patient makes to prevent flexion of the leg. Marked polynuritis is exceptional in tuberculous and cerebrospinal meningitis, therefore this symptom, when pronounced, is of some importance in differential diagnosis. A position of talipes equinus may voluntarily be assumed by patients suffering from neuritis in order to lessen tension upon the nerve trunks of the leg. Neuritis is most marked in the combined myelitic and meningitic forms of poliomyelitis.

Hyperesthesia is most intense and generalized in the preparalytic stage. It is almost of constant occurrence at this time, and is very marked in the part of the body which later becomes paralyzed. Hyperesthesia of the skin is common, but the muscles may also be involved to a lesser extent. In the paralytic stage the most frequent localization is along the spinal column, but it may occur in any part of the body. If the abdominal wall is affected, appendicitis may be closely simulated. The pathological basis for the symptoms is probably the cellular infiltration of the nerve roots at their point of emergence from the inflamed and edematous pia mater. Passive motion is painful in poliomyelitis, but this is not due to hyperesthesia but rather to polynuritis. This symptom of hyperesthesia cannot be considered a specific sign of Heine-Medin's disease because it may occur in any form of meningitis. It is often marked in epidemic meningitis but, from a comparative study, there is little doubt that it is more generalized and more severe in poliomyelitis. It is properly classified by Muller as one of the "three cardinal symptoms of the preparalytic stage."

In diphtheritic paralysis, hypertension of the cerebrospinal liquid may exist and an increased quantity of spinal fluid may be obtained on lumbar puncture. This was evidenced in one of our patients before rachientesis, by the presence of a positive Macewen's sign.—(*Arch. Diag.*, July, 1918.)

Dichloramin-T.

Dichloramin-T—popularly known as "oily Dakin's"—is the one efficient antiseptic so far evolved by the war which we believe will find the greatest popularity with the busy surgeon in everyday work, both because of its efficiency and con-

venience of application. Sweet (*J. A. M. A.*, 1917, Vol. LXIX, p. 1076) finds objections to the older chlorin-containing solutions on the grounds that they are not particularly stable and must be prepared with care; further, that these solutions contain so little antiseptic value that they must be frequently renewed in the wound. He thus summarizes the advantages of the newer substances in wound treatment:—

The amount of the solution is of small bulk. The number of wounds which a surgeon can dress in a given time is far greater than by any other method. The elimination of the Carrel tube simplifies the dressing and saves the time taken by the nurse for the periodic flushing. It saves the pain of wound dressing and effects an appreciable saving of dressing material.

Dakin's new dichloramin solution is made by dissolving crystals of dichloramin-T in chlorinated eucalyptol and then diluting this solution by the addition of chlorinated paraffin oil. (Detailed directions are given in the literature accompanying the substance as supplied by commercial houses.)

It is best applied by an oil spray, an ordinary hard-rubber or all-glass atomizer being the most practical method; metal atomizers are not suitable, since the metal is attacked by the chlorin. The old dressing is lifted off and the wound sprayed; the force of the spray will dislodge sloughs and the wound is covered with a fresh dressing.

The solution contains enough available antiseptic so that one dressing every twenty-four hours is ample for large, deep wounds, and one dressing every forty-eight or seventy-two hours is enough for the simple or more superficial wounds.

Lee and Furness contributed a paper on the use of dichloramin-T in the treatment of infections and infected wounds (*Ann. Surg.*, Jan. 1918, Vol. LXVII, p. 14; *Surg., Gynec. and Obstet.*, Feb., 1918, p. 155). This paper is based upon the records of 6028 civil cases in which the germicide has been used and of 1200 war wounds reported by Sweet. In this article there is described in detail the treatment of infections (including intra-abdominal), burns, and lacerated, crushed and massive wounds. Water, alcohol, and hydrogen peroxide decompose dichloramin-T. Tissues must be thoroughly dried before the spray is applied. For the first dressing the substance is used in 20 per cent. strength, while for subsequent dressings 5 per cent. suffices.

The writer uses dichloramin-T as a prophylactic agent in fresh operation wounds. Before closing the wound it is sprayed in all nooks and crannies with the substance. In anastomosis operations upon the digestive tube it is the writer's custom immediately upon opening the stomach or bowel to spray the mucosa with dichloramin-T. Used in this way, as nearly as can be judged, good results have been obtained.

Dichloramin-T has also been used successfully to abort boils. Given a boil in the hard painful stage (i. e., up to the fifth day), take a hypodermic and pass the needle down through the core to its bottom; make the injection while withdrawing the needle. A burning sensation occurs and a slight increase in the swelling from irritation; but if the boil is going to abort, it fades away silently and stealthily without any discharge.—(*Med. & Surg.*, Vol. II, book 2.)

Gastric Hemorrhage.

Frank Smithies, of Chicago, believes that after copious hemorrhage, rectal feeding should be instituted within twenty-four hours. He has found satisfactory a nutrient enema consisting of glucose 1 ounce, 50 per cent. alcohol 1 ounce, with normal salt solution sufficient to make 8 ounces. This should be given by the drop method—20 to 40 drops a minute—and from three to five enemas administered daily.

Mouth feeding should not be initiated until all vomiting or retching have ceased and until chemical examination of the stool demonstrates an absence of blood. When mouth feeding is instituted, the diet should consist of warm liquid carbohydrate gruels (cream of wheat, farina, strained oatmeal, malted milk, etc.) and warm cream for a week. Care should be taken that at least 1,500 calories of food are given daily. If after a week carbohydrate gruels are well borne, then a regime similar to the following may be instituted.

BREAKFAST.

- 1 pint of hot skimmed milk.
- 1 dish of thin cream of wheat, farina or strained oatmeal.
- 3 zwieback.

10:30 a. m.

- 1 pint of hot milk.
- 2 zwieback.

NOON.

Thin creamed soup made from all kinds of vegetables, but strained. Crackers may be taken with soup. Oyster soup may be eaten.

Small amounts of mashed potatoes, 6 ounces of steak to chew, thin custard and 3 zwieback.

3:30 p. m.

- 1 pint of hot skimmed milk.
- 3 zwieback or graham crackers.

EVENING MEAL.

- Creamed soup or cereal with hot milk.
- 1 very soft boiled egg.
- 3 zwieback.

BEDTIME.

- $\frac{1}{2}$ pint of hot skimmed milk and 2 zwieback.

By the end of six weeks after the hemorrhage, the patient should be ready to take general soft liquid diet with a limitation upon fats and proteids. Raw milk should be interdicted for as long as three months after the hemorrhage. It is usually poorly borne inasmuch as the tough casein clots remain for a long time in the stomach and act as stimulation to peristalsis and gastric secretion. They infrequently are productive of annoying distension, belching or vomiting. All milk should be parboiled and citrated—1 grain of sodium citrate to each ounce of milk.

Medicinally, after the chemical tests upon the stools or vomitus have proved that there is no further bleeding, the bowels may be kept open by a teaspoonful of artificial Carlsbad salts or an equal amount of non-effervescent phosphate of soda taken in a half-glass of water the first thing in the morning. If this is poorly borne then a tablespoonful of liquid paraffin in twice this amount of warm cream may be given four times daily. In some instances the liquid paraffin appears to exert a protective action upon the bleeding surface.

The anemia incident to severe hemorrhage is most efficiently and rapidly counteracted by prompt transfusion of whole blood. It is quite likely that the healing of bleeding ulcers would be more rapid and more satisfactory with less tendency to recurrence were transfusion resorted to more frequently than is the common rule. By the Percy method the procedure is simple, and if the bloods have been grouped according to the method of Water Brem, there is practically no danger. If transfusion is not resorted to, then very promptly the intramuscular injection of one ampoule daily of iron and arsenic should be started. When the stomach is able to retain food, ascending doses of Bland's pill may be employed. Ten grains should be given three times daily and every third day the dose should be increased 5 grains. By the end of the first month the patient should be taking 30 to 40 grains three times daily at the minimum. The dose should be continued for at least three months even if the blood count appears normal. When the daily dosage has reached 50 grains T. I. D. the amount may be reduced 5 grains every three days in a fashion similar to its increase. Annoying gastric eructations, pyrosis and burning pains in the epigastrium are usually relieved promptly by regulating the diet and by the free use of calcined magnesia or milk of magnesia.

During the treatment for the immediate accident of hemorrhage, search of the primary cause of such hemorrhage should be instituted, and if possible, removed. A hemolytic infection in the tonsils or about a tube or in a gall-bladder, or appendix, would seem at times to be not a negligible agent in causing an initial hemorrhage from a diseased focus of the stomach or laying a foundation for such hemorrhage. If clinically a roentgen examination should definitely reveal a lesion at any part of the stomach, pylorus or duodenum (ulcer or cancer), then it would seem safest to suggest laparotomy when the patient has become a fairly good surgical risk. In that type of case where so-called vicarious hemorrhages take place, operative procedures upon the uterus or its adnexa may prove necessary before these periodic hemorrhages cease. Occupational handicaps should be overcome when possible, particularly those occupations associated with metal dust or other chemical or gaseous poisonings.—(*Med. and Surg.*, Feb., 1918.)

Present-Day Applications of Experimental Psychology.

In the first of his two recent lectures at the Royal Institution Lieutenant-Colonel Charles S. Myers, R. A. M. C., dwelt mainly on the application of psychological experiment to industrial efficiency. Laboratory researches on mental and muscular work had shown the relation existing between rest and length of task, the importance of determining and employing the optimal load, and the various psychological factors which affect the work curve. A study of these factors brought out the economic value of introducing scientific management and systematic rest pauses in the workshops and of selecting by appropriate tests employees fitted for tasks demanding special ability. There was, he said, a wide difference between the

increased production due to scientific shorthand methods in industrial efficiency and that due merely to the dangerous process of speeding-up. Real industrial efficiency would result from the establishment of vocational bureaus, where lads and girls on leaving school were psychologically examined, and advised on the basis of this examination, supplemented by a dossier of opinion collected during their school career, as to the occupation for which each was best fitted.

In his second lecture Colonel Myers passed on to the subject of nervous breakdown and the crucial importance of its early and skilful treatment in industrial life. Psychologists are now alive to the preponderating influence of the feelings, in the light of which current conceptions of memory, of personality, and of consciousness required to be revised. A case in point was brought forward by Colonel Myers, who mentioned the danger attending the apparent cure of contractures, paralysis, tremors, and other functional bodily disorders when practiced without reference to the psychic disturbance from which they arose. He concluded by impressing the need for continuing and even developing in peace-time the special hospitals and the special psychological training of doctors which had been found essential in order to deal with the effects of war strain.—(*Lancet*, April 27, 1918.)

The Identification of the Meningococcus.

The *Journal of the Royal Army Medical Corps* for January and February contains three interesting communications dealing with the bacteriology of cerebro-spinal meningitis. 1. Captain W. J. Tulloch discusses the mechanism of the agglutination reaction and records some experiments bearing upon the question. In the second part of his paper he presents the results of agglutination and absorption tests which he performed upon a large number of presumptive meningococci, using the four-type agglutinating sera prepared upon the basis of Lieutenant-Colonel M. H. Gordon's classification.

He found that of these 66 per cent. could be unequivocally placed in one of the four groups by agglutination alone. A further 26 per cent. reacted with two sera of allied groups, but of these the majority could be placed definitely in a single group by the application of the absorption test. Twenty-three strains (6.5 per cent.) reacted with two or more sera without any group connection, and three of these were equally, though feebly, agglutinated by all four sera. By absorption tests, however, most of these could be placed in a definite group.

Group II. was found to be complex. Finally, 2 to 3 per cent. of strains failed to respond to any of the sera. Thus, some 98 per cent. of the cocci could be identified as meningococci by the quadruple agglutination test, and the majority of these were susceptible of classification into four fairly well defined, though inter-related groups by means of agglutination and absorption tests carried out with four sera selected by Colonel Gordon for the purpose.

Captain Tulloch's experiments are thus in full agreement with Colonel Gordon's previous work, and they afford evidence that the four-type system provides a trustworthy means of identification of the meningococcus as a whole. At the same time, they contain a strong suggestion that the division into four groups may not represent a complete statement of the true biological relationship of the various individuals of this species. The linking of the four groups into two pairs, the recent subdivision of Group II., and the existence of a number of strains which present individually almost every possible combination of reactions with the four sera, and thus bridge the gaps between the groups, all suggest the possibility that the differences between strains may, in fact, be of a quantitative rather than of a qualitative nature.

Much further investigation is required to show whether Colonel Gordon's classification is more than a stepping-stone on the path of knowledge. 2. Colonel Gordon gives an account of the steps of his researches on the meningococcus which led to the routine adoption by the Royal Army Medical Corps of the agglutination test for the identification of that organism, and to the establishment of the Central Cerebro-spinal Fever Laboratory, and he gives a full account of the methods in use there. He accepts Captain Tulloch's subdivision of Group II. into three distinct subgroups, but he does not consider that this upsets his main classification. He concludes with an inquiry into the reasons for the failure of other recent investigators to arrive at conclusions identical with his own. 3. Captain J. A. Glover gives an instructive description of the bacteriological aspect of a cerebro-spinal fever epidemic at "X" Depot in 1917. The relationship of the incidence of the disease to cold weather and overcrowding is clearly brought out, and a striking premonitory rise of the carrier-rate before the incidence of the first case is shown.

Of the 14 meningococcal strains isolated from actively infected men, 13 were identified with Gordon's Type II. and

One with Type I. In an outbreak at the same dépôt in the previous year Type II, coccus had been isolated in every case, and the same type became predominant in the premonitory rise for the carrier-rate in the present epidemic. Captain Glover ends with an account of a prophylactic scheme for 1918, which has been elaborated as the outcome of the experience and laborious investigations described in this paper.—(*Lancet*, No. 4939.)

War Medicine and Surgery

The Etiology and Treatment of "Trench Foot."

Majors Joshua E. Sweet and George W. Norris, M. R. C. and Dr. Harry B. Wilmer, M. R. C. discuss this subject.

The usual classification of the disease known as "trench foot" is based entirely upon a clinical picture. From this clinical picture also the attempt is made to deduce the etiology, and the nature of the most severe type of case is such as to seem to warrant the conclusion that the disease starts from the outside of the foot. Therefore the most common form of treatment is a purely local one.

They advance evidence which shows that the disease in all its forms starts from the interior, and that the infections which often mark the course of the disease are but the natural secondary manifestations of the reaction of devitalized tissues to infective agents; that, therefore, the treatment of the condition should be directed to the skin only in so far as these secondary infections have resulted in surgical conditions.

There is a disease of civil practice which bears a certain resemblance to "trench foot." This disease is, or these diseases are, known as "Raynaud's disease," "intermittent claudication," "erythromelalgia," "thrombo-angitis obliterans," perhaps best grouped under the generic name of the angio-trophonuroses. Nothing is known of the etiology, much has been written, no treatment is accepted.

The suggestion which has often been made in regard to this group of diseases, that the condition is due to a vaso-motor spasm, led us to the attempt to discover if there is any clinical evidence of vaso-motor disturbance in "trench foot" beyond the ocular evidence of whitening of the skin, or hyperaemia, oedema, and so forth; the very suggestive observations given below in detail were the result of this attempt. There is in "trench foot" a marked increase of blood pressure as determined by the usual clinical methods as compared with that in the arm, the patient being in the horizontal position; that is, there is a marked increase of the resistance in the leg to the obliteration of the pulse by the pressure of the cuff, as compared with this resistance in the arm. It is this increased resistance which we mean by the term "increased blood pressure" in this paper.

In normal individuals lying horizontally blood pressure in the arm and leg is practically equal. On assuming the standing posture, blood pressure in the arteries of the lower extremity rises in exact proportion to the weight of the hydrostatic column of blood. This increase is approximately 2 mm. for each inch.

In many cases of aortic insufficiency, especially in those in whom compensation is good, the leg pressure definitely exceeds the arm pressure, even in recumbency. So far as we are aware, this is the only condition heretofore known in which such a pressure difference is commonly, if not constantly, present.

There is not complete agreement among physiologists, as to the exact mechanism by which this discrepancy between readings from the leg and the arm is produced; but the rival theories agree in attributing it to an increased tone, or an increased rigidity, of the wall of the artery itself. How far into the periphery such a condition might extend is perhaps indicated in cases of "trench foot" by the local disturbance in the foot itself, and leads us to suspect that the process extends to, and involves the arterioles.

Now whether this arterial spasm or increased resistance of the artery to an external force be due to an excess of vaso-constrictor influence, or whether it be due to a loss of vaso-dilator influence, the result being the same, it would seem that an attempt to increase the proportion in the circulation of substances tending to reduce blood pressure would be a reasonable therapeutic indication.

The opposite picture to peripheral vaso-constriction is seen in hyperthyroidism, as evidenced by the sweats, the sudden diarrhoea, the flushings, perhaps also the tachycardia; therefore we have resorted to the administration of potassium iodide, which is known to stimulate the thyroid; thyroid extract is the first thought, but we had none at hand.

It may be asked why, when the edema and the diapedesis of red cells comes from the capillary walls, we blame the arterioles

rather than the capillaries. The reason is our finding of increased arterial resistance and the spasmodic nature of the attacks of pain.

Physiologists are not yet agreed as to the point in the vascular system where the blood-stream encounters the greatest resistance, but the majority of opinion seems to be that it must be in the arterioles because the blood passing from the arterioles enters an area in which the total cross section is enormously increased; further, the arteriole is the only peripheral vascular structure which possesses a mechanism intrinsically capable of change. At least no such mechanism has been demonstrated in the capillaries nor in the small veins. Any change in the pressure in the arteriole would be expressed by changes in the capillary blood, for as long as there is any circulation at all there must be a plus pressure in the arterioles; even after death there must be a residuum of plus pressure in the arterial side, for the arteries are empty in the cadaver.

The circulation of blood in the veins of the foot is dependent upon several factors—the driving pressure of the heartbeat, the consequent filling of the system, and the resultant *vis a tergo*; the action of the skeletal muscles, perhaps the most important factor in the peripheral circulation of lymph and venous blood, a factor too completely forgotten in various surgical conditions. This factor is of such importance that it is said that mere standing still will impede and may suspend the flow of blood through the foot; the value of rubbing the feet, of moving about while in the trenches, is based upon this consideration of physiology.

Now the standing still in the cold and wet may be the causal factor in "trench foot," as it must be the exciting factor, in which event, however, all men should be susceptible. Since all men under the same conditions do not fall victims, and since in the men who are affected these facts of "clinical blood pressure" which we herewith demonstrate are to be found, we feel compelled to the conclusion that "trench foot" is a disease incited by the effect of cold and inaction upon a foot whose vaso-motor system is physiologically impaired, and therefore also more rarely we encounter a "trench hand" and "trench knees."

Our explanation of "trench foot," based upon our reasoning and our findings, is that there is a spasmodic contraction of the arterioles of the foot.

The first result of this arteriole spasm is ischemia with numbness, tingling, burning pain; the second result is a disturbance of capillary circulation, perhaps due to back pressure from the veins, perhaps due to the loss of rhythmicity of the driving force, perhaps to mere stagnation, with swelling of the foot from edema and diapedesis of red cells. This results in devitalization of the skin and the favouring of infectious processes, and may extend to actual gangrene.

It is evident that much work is needed to clarify the problem. They venture this preliminary report because of the importance of the facts shown, and because we are convinced that potassium iodide is a most important addition to the treatment of "trench foot," for the prompt alleviation of pain, if for no other reason.

Their readings were made with two different types of aneroid sphygmometer. They were made with the patient recumbent and relaxed, first upon the leg and then upon the arm. The usual clinical precautions were taken to eliminate avoidable errors. The auscultatory method was used, the systolic pressure being read at the first regular appearance of sound, and the fifth phase being chosen as the diastolic criterion. The fifth phase rather than the fourth was chosen owing to the difficulty of identifying the onset of the fourth phase in an artery as small and as difficultly accessible to the stethoscope as the posterior tibial. In a few cases readings had to be made from the dorsalis pedis owing to the topography of the posterior tibial artery. They state that they attach far less weight to diastolic readings in the leg, as some of them were obtained with difficulty and occasionally uncertainty. The systolic readings, however, they believe to be clinically accurate.

Clinical and experimental investigation has shown that the iodides exert no direct action upon blood pressure. Although frequently prescribed in cases of arterial hypertension, they are beneficial chiefly in syphilitic individuals, and even in these their action is indirect, and their blood-pressure lowering effect slight.

The number of cases of "trench foot" on which we have made blood-pressure estimations to date is 53. Pressures were also taken on eight other cases not suffering with "trench foot" to serve as controls.

With but one exception an inequality of the leg and arm pressure was found in the 53 cases of "trench foot," consisting in a very definite increase of the leg over the arm pressure. In the one exception the arm pressure exceeded the leg pressure; after 48 hours reverting to the condition found in the other 52 cases. In the eight cases used as controls the pressure was found equal in the arm and leg.

The leg pressure was also found increased in direct proportion to the severity of the case. As the patient's condition improved the pressure was found to drop, or in some instances, few in number, the arm pressure would rise, and by the time the patient had recovered, the arm and leg pressure had become equal; 13 cases so far have been observed which show this phenomenon. These 13 cases, together with the 7 suffering from other conditions, justify the conclusion that the differences observed in "trench foot" cannot be ascribed to some technical fault in their blood-pressure readings. The differences in arm and leg pressure are as follows: the maximum 30 mm., the medium 15 to 20 mm., the minimum 8 to 10 mm. In 31 cases potassium iodid in 20 gr. doses three times daily was given, with the result that there was a decided relief of pain in 24 hours after the first dose had been given. There was also coincidentally with the relief of pain in many of the cases a fall of pressure, an average drop of the leg pressure of 10 to 15 mm.

In all of the 31 cases the potassium iodid was withheld for 24 hours on three occasions. The complaint from the patient the following morning was increased pain and insomnia. In some of the cases the dose of potassium iodid was increased to 30 gr. three times daily, as 20 gr. did not seem sufficient to control the pain.

They have not used sodium bromid, Dover's powder, morphin tartrate, or any other form of hypnotic in 29 out of 31 cases. The potassium iodid seemed more beneficial in the relief of pain than any of the above-mentioned drugs. The two remaining cases were given 5 gr. each of Dover's powder at night for four consecutive nights. Both of these patients were severely affected; one had a gangrenous degeneration of the small toe, and the other case marked discoloration and blisters of both feet. One of the 29 cases treated with potassium iodid alone was also a severe type with marked discoloration and blebs of both feet. The potassium iodid was sufficient in this case to control the pain.

It must not be understood that the relief from pain is absolute, but the authors feel thoroughly convinced from comparing the cases treated with potassium iodid with others treated by the ordinary methods that the relief is greater in the cases in which the potassium iodid alone has been given, and that the duration of the attack is markedly shortened.

The only other treatment used in these cases has been hot-water bottles to the soles, boric powder dusted on the feet, and flannel bandages.—(*Lancet*, Ap. 20, 1918.)

Treatment of War Wounds.

The Inter-allied Surgical Commission on Treatment of Wounds arrived at the following conclusions (*Bull. Méd.*, Paris, 1917, p. 125):—

1. It is desirable that the organization of service be so arranged as to permit a continuity of surgical direction in the treatment of the wounded.

2. In the fighting posts, and especially in the trenches, surgery should be reduced to the minimum: it must be limited to dealing with complications which may be immediately mortal and to the cleansing of wounds. The wound should neither be explored nor irrigated; it should simply be protected by a dry aseptic or antiseptic dressing.

3. It is essential to transport the wounded as quickly as possible to one of the large hospitals at the front which are situated at from 10 to 20 kilometers from the firing lines.

4. It is advantageous that each of these hospitals should have one, or several attached advanced annexes, nearer to the firing line, so as quickly to receive certain classes of severely wounded, those in shock or attacked by severe hemorrhage, thoracic, or abdominal injuries, etc.

5. Generally speaking war wounds should be considered as contaminated or infected.

6. The object of treatment should be: (1) to prevent infection of the wound if only contaminated, or to obtain sterilization if infection is evident; (2) to permit suturing when clinical sterilization has been obtained.

7. Wide opening up of the wound with resection of contused tissue, removal of debris of clothing, etc., should be considered a matter of course, with exceptions only in certain cases which can be rigidly supervised.

8. After such intervention immediate suture is capable of giving favorable results, especially in articular wounds. It should be executed only in cases in which the wound is but of a few hours' duration, maximum eight hours, and when the surgeon can continue supervision of the patient for fifteen days.

9. If immediate suture is not done, secondary suture must be resorted to when sterilization of the wound is sufficiently clinically evident.

10. Evolution of the wound should be systematically controlled by periodic bacteriologic examinations which will allow

the construction of a microbial curve and determine the degree of sterilization.

11. When there is necessity of evacuating patients whose wounds have been opened up and excised, a dressing should be applied, the action of which would continue during all the time of transport. There is need of research in this respect.

12. Several methods of progressive sterilization of wounds exist, which permit secondary suture regularly.

X-Ray Characteristics of Shrapnel Balls.

Howard Pirie, on a basis of 10,000 x-ray findings, compares the characteristics of the x-ray image of shrapnel balls with that of bullets and other foreign bodies. He states that shrapnel balls, which are most usually of lead, though sometimes of iron, may be found entire without any alteration of shape, and every stage of deformity may be met with until an appearance is obtained as if the ball had exploded into fine particles. Only two bones, in the author's experience, have proved impenetrable to shrapnel balls, namely, the femur in its shaft, and the vault of the skull; he has no record of a case in which a shrapnel ball entered the brain.

The x-ray characteristics of a shrapnel ball when broken up are rounded or slightly ragged edges, scarcely if at all serrated; one piece may show part of the round outline of the ball, and minute fragments like dust are noticeable along its track. In the broken-up bullet the larger pieces are very ragged; one piece may show something of the form of the bullet, and there are minute dust-like fragments. In multiple iron foreign bodies the edges are serrated like broken cast-iron; the fragments are not so numerous as in the broken-up ball or bullet, and when numerous fragments are present they are more widely separated, and there are many separate wounds of entry; dust-like particles are absent. The contrast between damage done by a bullet and that done by a shrapnel ball is very marked in cases where a direct hit is made on the femur or on the skull. A bullet hitting the femur splinters the bone as it does a glass bottle; at the same time the bullet breaks into pieces, and its fragments and those of the femur are scattered through the limb. In the case of the shrapnel ball, when the femur had received a direct hit, the ball was broken into two or more pieces, and had just roughened the bone surface.—(*Arch. Radiol. and Electrother.*, Oct., 1917.)

The Treatment of Malaria.

Provisional instructions for the treatment of cases of malaria in the United Kingdom, printed in the *Journal of the Royal Army Medical Corps*, September, 1917, are based upon work done in special malaria wards in England during the preceding five months by a number of specially qualified medical officers. No line of treatment yet tried and more than twenty different lines have been tried) has sufficed to eradicate the infection entirely in more than a small percentage of cases, and no clear indication has yet been obtained that any one line of treatment is much better in this respect than any other.

A series of new instructions is given as regards dosage and other points. It has been decided that every case of malaria should be given sixty grains of quinin every week until he has been free from malarial fever for at least sixty days. The dose may be administered intramuscularly or by the mouth in the form of sulphat, hydrochlorid, or bi-hydrochlorid, and it may be given at the rate of ten grains daily on six days in the week, or of fifteen grains daily on four days in the week, or of twenty grains on three days in the week, or of thirty grains on two days of the week, on consecutive days or not. The individual dose may be five grains, ten grains, or more, in solution, powder, or tablet, as convenient. It will thus be seen that it is not easy to stamp out the infection of malaria.

This is pretty much what the old clinicians found and taught. The only way to ensure success is to continue the drug over long periods, and the plan of giving sixty grains a week is useful, but it must be kept up for two months or for three if possible. The difficulty in dealing with large bodies of men is to be certain that they will go on taking the drug regularly; it is in private practice that the best results of quinin treatment are obtained. A word of warning may be given as regards pills and tablets; they may, especially if sugar-coated or old, pass quite unchanged, and in such a case the patient is not being treated at all. Fresh tablets not sugar-coated seem to dissolve very well, however, but if symptoms of fever continue the possibility that they are not being dissolved should be borne in mind.

Pirie reports 12 cases of tuberculous glands successfully treated by X-rays.